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## TACOMA: A STORY OF MUNICIPAL PROGRESS

Rapid Development During the Past Few Years—Operates Its Own Light and Water Plants at a Good Profit—  
Experiments with Street Paving—Franchise Tax Is Paid by Public Service  
Corporations—A Beautiful City of Homes

By James Boyd Nesbit \*

LYING almost within the morning shadow of the magnificent mountain from whence it derives its name, Tacoma is one of the modern cities of the West whose municipal development has commanded general public attention. In achieving her present proportions Tacoma has rounded out in all directions, no effort being omitted that would strengthen and support her growth, so that the wonderful material advance in shipping and manufactures during the past two years has been paralleled by the expansion of public utilities, by the construction of splendid homes, the adornment of parks, the improvement of streets and the opening of colleges, libraries, schools and other institutions of benefit to all the people. The æsthetic has not been sacrificed to the material, but has kept pace with it, giant-like though the strides have been.

The seer is rarely honored, yet few people who are conversant with the facts have ever doubted the fulfillment of George Francis Train's prophesy, made ten years ago, that Tacoma is the "City of Destiny." Commanding the most available and best deep water harbor on the Pacific Coast of America, with incomparable natural resources in mining, lumber, agriculture and fisheries, and with trans-continental railway and trans-oceanic steamship lines

bearing here for shipment the multiplied products of mankind, there is every sound business reason for the statement so frequently made that within a half century Tacoma will be one of the four chief cities of the world. The natural increase in Public trade alone will build several thriving shipping ports, such as the Atlantic seaboard possesses; but Tacoma's superior and exclusive advantages give her a

lead over all competitors analagous to that which New York possesses over Philadelphia or Charleston. Time will but emphasize the importance of these advantages. It is here the rails first meet the sails in a double sense, for, while Tacoma is reached more quickly from New York than any other Pacific port, it is also reached from the Orient in two days less time than can possibly be made to San Francisco. Barring all other considerations, this element of time will eventually divert all trade to the northern and shorter route.

Tacoma commands five miles

of water front on the southern and western shore of Commencement Bay, a commodious arm of Puget Sound and really forming the head of deep sea navigation. This water front has been improved at municipal and private expense by filling in the tide lands and by dredging deep channels through the tide flats so as to permit ready access to the manufacturing district by deep sea vessels. The 369



PACIFIC AVENUE AND NINTH STREET, SHOWING FIR BLOCK PAVEMENT

\* Tacoma, Washington.

## POPULATION, AREA AND ASSETS OF FOURTEEN CITIES

	Population.	Area, acres.	Cash in treasury.	Cash and bonds in sinking fund.	City hall.*	Police department.*	Fire department.*	Schools.*	Libraries.*	Parks.*	Total assets.
Altoona, Pa.	38,973	1,589.99	\$57,489	\$88,419	\$105,900	\$6,650	\$74,469	\$500,000			\$2,349,157
Wheeling, W. Va.	38,878	2,745.00	45,630		100,000	2,500	118,500	800,000	\$27,749	\$75,000	2,952,542
Mobile, Ala.	38,469	5,125.00	3,905		2,600	27,400	36,250			500,250	1,788,510
Birmingham, Ala.	38,415	4,053.30	267,540	16,124	124,000		88,060	260,500	a	211,000	1,207,636
Little Rock, Ark.	38,307	7,328.00	8,020	18,244	27,000	2,000	30,000	262,479		860,700	1,402,380
Springfield, O.	38,253	5,900.00	130,335		240,000	7,000	106,000	390,000	126,500	50,500	2,016,408
Galveston, Tex.	37,789	8,134.00		981,238	101,000		92,700	546,000	4,500	165,000	4,008,593
TACOMA, WASH.	37,714	19,599.00	126,723	37,618	349,980	13,188	174,537	848,061	17,457	344,943	4,991,953
Haverhill, Mass.	37,175	20,480.00	79,235	444,370	116,000	7,450	136,985	572,050	94,600	193,295	3,710,191
Spokane, Wash.	36,848	12,960.00	151,057	10,125	126,700	17,280	73,454	692,527	11,744	94,003	3,320,418
Terre Haute, Ind.	36,673	3,500.00	118,209	30,435	37,500		92,199	498,550	31,000	28,000	950,510
Dubuque, Ia.	36,297	7,680.00	87,746	17,876	40,000	4,500	100,504	366,000	\$16,000	101,000	1,434,312
Quincy, Ill.	36,258	3,533.80	52,529	111,570	105,000	1,000	72,500	293,000		216,000	1,230,975
South Bend, Ind.	36,000	3,919.38	167,221	†	\$15,000	10,000	69,970	431,284	66,298	20,000	1,259,776

† Included in cash in treasury. ‡ Land only. || Not including land and buildings. ¶ Included in city hall. a Included in schools.

manufacturing establishments of the city are thus all within touch of rail or boat, affording facilities for quick handling of the completed products that are of the greatest importance. Along the commercial wharves, for a distance of two miles, the water front is built up with wheat elevators, coal bunkers and grain and freight warehouses. One of these, for the storage of wheat, measures 2,360 feet in length and is the longest in the world. The loading of vessels is all done at the Tacoma wharves by electrical conveyors. During the year 1901 there were 852 deep sea arrivals at these wharves, bringing imports valued at \$11,495,859 and carrying away exports valued at \$22,904,877. The value of Tacoma's manufactures for the same time was \$19,642,500.

## GROWTH AND POPULATION

Comprised within a generation of time, the history and growth of Tacoma tells the development of the Puget Sound country better than any other story could do. From a single sawmill established on the shores of Commencement Bay in 1867 (and still in operation), there has been built a city with a present population of 45,000, possessing all modern conveniences and public improvements. Practically all of this growth has been accomplished since the advent of the Northern Pacific Railroad in 1883, and the best part of it belongs to the past decade. Like many other municipalities, Tacoma was chastened by the "hard times" from 1893 to 1896, which checked the era of speculation in land values and served a useful purpose in forcing these values to depend entirely upon the material progress in commerce and industry that had already been achieved. But as soon as the actual growth of her resources passed the stage to which speculation had forced values, the advancement of the city became steady and rapid. In the past four years her growth in all lines has been marvelous and can only be thoroughly understood by people who are aware of the immense natural resources in the country tributary to her.

The permanency of the city is not now questioned, even by her rivals. With her manufactories employing 6,922 operatives, at a monthly wage of \$372,340, and representing an invested capital of over twelve million dollars with her enormous shipping business leaping forward every year; with her vessel-plied harbor sheltering the merchant marine of the North Pacific and with her various other interests aggregating a splendid volume of trade, there is a confi-

dence in her future that is manifested in many practical ways. During the past year, for instance, there were twenty new manufacturing plants established, twenty-two new business blocks erected, forty-four new schools, churches, libraries and warehouses and three hundred and forty-nine new residences built. There were also two new trans-Pacific steamship lines established and a railroad is now being built to tap the vast resources south of Mount Tacoma.

## ITS FORM OF GOVERNMENT

The government of Tacoma is vested in a mayor as the executive head and in a legislative branch consisting of a council of sixteen members, two being elected from each of the eight wards. The only other elective officers are the controller and treasurer, all department officers being within the dispensing patronage of the mayor excepting that of city clerk, who is elected by the council. At present the Republican party controls all offices except that of treasurer.

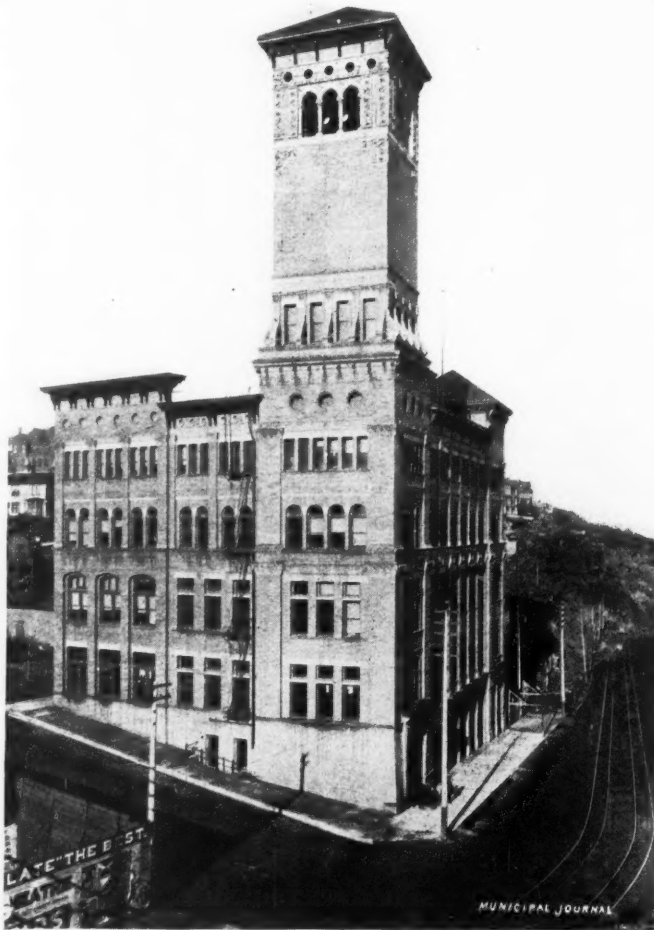
A municipal charter was framed by a board of freeholders and adopted by the people in the summer of 1890. Some few amendments have since been adopted in order to strengthen the instrument, but no sweeping changes have been found necessary, as the framers of the charter profited by the experiences of older communities and incorporated modern ideas in the fundamental law. Appropriate ordinances secure the enforcement of the charter provisions.

While partisanship is more or less pronounced in each municipal campaign, political preferences are nevertheless usually modified by local considerations and hence the men who have been called to the administration of city affairs have been men of sterling worth, with very few exceptions. Mr. Louis D. Campbell, the present Mayor, is a noted lawyer, a man of unquestioned integrity and of liberal public views. All his private interests are closely identified with the city

of which he has been the chosen head for the past two years, and though his conduct of public affairs has raised up opponents within the ranks of his own party, Mayor Campbell has given general satisfaction to the body of the people. With one exception, the heads of the various departments have been chosen because of their eminent fitness for the posts and have all conducted their departments with credit to the city and to themselves.

## FINANCES ARE NOW SATISFACTORY

Under the able and conservative public administrations that have



TACOMA'S SEAT OF GOVERNMENT



prevailed for the past five years the city's financial condition has been vastly improved, so that to-day there is a comfortable sum in the treasury and cash is being paid for all current expenses. So remarkable was the change that produced this satisfactory result that very few of Tacoma's citizens, even, fully appreciate the public devotion and financial skill that was brought to bear to achieve it. The restoration of prosperous times does not wholly explain it, because the reformation had commenced before the brighter era dawned and while the future appeared gloomy to all who were not possessed of strong faith. In 1895, with a bonded debt of \$2,730,000, with an empty treasury, with half a million dollars tied up in suspended banks, with a decreasing assessment valuation, with a floating debt of \$809,000 and with nearly 40 per cent. of all her taxes on the delinquent list, the city was in desperate financial straits. On two occasions the semi-annual interest on her bonds came due in New York and there was scarcely a dollar on hand to meet it. In this time of civic stress business men came to the treasury's assistance and



MOUNT TACOMA, FROM WHICH THE CITY TAKES ITS NAME

happy result that Tacoma is to-day one of the strongest and best governed cities, financially, to be found west of the Mississippi.

## OUTSTANDING BONDED DEBT

In February, 1900, the accumulated warrant

debt of the city was extinguished by the issuance of funding bonds to the amount of \$1,093,000. Since then the municipality has been on a strictly cash basis, every obligation being promptly met. To-day the total bonded indebtedness amounts to \$3,823,000, issued as follows:

Water and light plant bonds, \$2,080,000; City Hall bonds, \$200,000; Eleventh Street Bridge bonds, \$100,000; Funding bonds of 1891 to pay old indebtedness, \$350,000; Funding bonds of 1900 to pay floating debt, \$1,093,000. Total, \$3,823,000.

These are all 20-year gold bonds,

bearing 5 per cent. interest, with the exception of the city hall and 1891 funding bonds, which bear 6 per cent. All interest is payable semi-annually in New York City.

No issue of bonds has ever been sold at less than par and an issue commanded a small premium. No better evidence of the city's improved standing in financial circles is available than the fact that her 5 per cent. bonds were quoted at 109 to 110 during the past year. On January 1, 1902, the treasury had on hand a cash balance of \$210,638.59, which included \$43,506.60 of trust funds and a sinking fund for the redemption of bonds of \$44,258. This is derived from a special sinking fund tax.

The assessed valuation of real and personal property in 1900 was \$20,023,955. In 1901 it had slightly increased, amounting to \$20,578,272. During both these years the tax levy for municipal purposes amounted to fourteen mills. On the basis of such a valuation as this, a bonded debt of \$3,823,000 appears unusually large, being approximately 18 per cent. of the total; and it would be were it not for the fact that the light and water departments, for the purchase of which over-one-half the bonded indebtedness was incurred, are now producing more than enough revenues to pay all their current expenses and leave a considerable profit beside. This practically cuts the real interest-paying debt to \$1,743,000, or approximately 8 per cent. of the assessed valuation.

## THE LIGHT AND WATER PLANTS

Both the light and water plants were purchased from a private

## DEBT, VALUATION AND EXPENDITURE PER CAPITA

	Net debt.	Assessed valuation, real and personal property.	Expenditures for			Total.
			Police.	Fire.	Schools.	
Altoona, Pa. ....	\$26.13	\$412.47	\$ .46	\$ .51	\$2.24	\$6.56
Wheeling, W. Va. ....	16.47	609.18	.84	.90	2.62	10.45
Mobile, Ala. ....	21.37	415.56	.95	.54	*	5.97
Birmingham, Ala. ....	55.38	426.58	1.50	.88	† .73	8.76
Little Rock, Ark. ....	5.68	387.54	.81	.86	2.11	6.19
Springfield, O. ....	24.21	467.78	.72	.62	2.77	9.69
Galveston, Tex. ....	83.12	706.69				
TACOMA, WASH. ....	115.08	530.94	.92	1.22	3.34	30.45
Haverhill, Mass. ....	39.99	711.34	.88	1.38	3.46	16.19
Spokane, Wash. ....	77.86	528.65	1.15	1.81	3.29	15.77
Terre Haute, Ind. ....	10.70	556.65	.98	1.10	3.65	10.19
Dubuque, Iowa ....	44.55	658.67	.77	.83	2.81	9.74
Quincy, Ill. ....	28.04	127.23	.80	.75	1.94	7.19
South Bend, Ind. ....	25.51	417.99	.59	.82	2.49	7.72

\*Supported by state and county. †Not including \$0.54 expended by state and county.

## DEBT AND SINKING FUND

	Bonded.	Debt. Floating.	Sinking fund.	Net debt.	Legal borrowing limit.
					per cent.
Altoona, Pa. ....	\$1,089,500	\$17,100	\$88,419	\$1,018,181	*7
Wheeling, W. Va. ....	484,300	156,114		640,414	†5
Mobile, Ala. ....	750,000	72,000		822,000	†
Birmingham, Ala. ....	2,124,000	19,386	16,124	2,127,262	†
Little Rock, Ark. ....	118,000	117,963	18,244	217,719	†
Springfield, O. ....	881,186	45,000		926,186	†
Galveston, Tex. ....	3,945,000	177,399	981,238	3,141,161	†
TACOMA, WASH. ....	4,221,184	156,530	37,618	4,340,096	†5
Haverhill, Mass. ....	1,905,750	25,142	444,370	1,486,522	2½
Spokane, Wash. ....	2,465,192	413,010	10,125	2,868,977	5
Terre Haute, Ind. ....	359,000	63,890	30,435	392,455	†2
Dubuque, Ia. ....	1,372,012	252,884	7,876	1,617,020	†5
Quincy, Ill. ....	1,099,400	28,522	111,570	1,016,352	†5
South Bend, Ind. ....	920,170	39,898	41,830	918,238	†2

\* Of assessed valuation of real estate. † Of assessed valuation. ‡ No limit. § Controlled by legislation. || Of assessed valuation for three years, not including water debt.

advanced the money so that default would not be made and the ruin of Tacoma ensue.

Measures of the severest economy were rapidly passed by the council. Some city departments were abolished, while in all others the working force was reduced from one-fourth to one-half and salaries in many cases were cut in two; even the mayor's salary was pruned from \$2,400 to \$1,200 per annum. The pay roll was far in arrears and it was not an infrequent occurrence for several months to elapse before the treasury contained enough money to pay a single month's salary to employees. Outstanding warrants—and there were many of them—were hawked among the brokers and often failed to bring more than 60 or 70 per cent. of their face value.

When Mr. A. V. Fawcett was elected mayor and assumed office in the spring of 1896 he brought to bear upon city affairs the training of a successful business man, and inaugurated methods of administration that almost immediately produced a salutary effect. Confidence was restored and an impulse given toward civic progress that speedily brought back conditions to a normal basis. This policy has been consistently followed by succeeding administrations, with the



LOUIS D. CAMPBELL,  
Mayor

corporation in 1893, the people voting the bonds after a memorable contest. It was claimed at the time, and with considerable justice, that the price paid was far in excess of the value of the plants, as the company did not possess nearly the amount of piping, fixtures and machinery it had represented. Subsequent to the purchase a damage suit against the company resulted in the city securing a verdict for \$787,000. This was finally compromised by the company paying \$100,000 in cash into the treasury and by turning over to the city the electric plant and business of the Commercial Light & Power Company, a concern owned by the offending corporation that had made the light and water plant sale.

The water supply system was first constructed in 1884, but since its acquirement by the people a large sum of money has been expended on its improvement, so that to-day it represents a total cost of \$1,509,322. The supply is secured from Clover Creek, a crystal stream ten miles distant that is fed by mountain springs. This stream furnishes an abundance of pure and wholesome water, flumes conveying it by gravity to the pumping plants. These force it to a large reservoir that feeds the mains in the lower part of the city, and also to a stand-pipe on the brow of the plateau, from whence the residence section is supplied. The mains range from six to thirty

#### STREET CLEANING STATISTICS

	Swept by hand or machine.	Swept by city, sq. yds. per week.	Persons employed by city.	Cost of maintenance.
Altoona, Pa. ....	Both	410,000	12	\$4,742
Wheeling, W. Va. ....	Both	40,000	8	5,704
Mobile, Ala. ....	Hand	152,000	35	\$24,013
Birmingham, Ala. ....	Both	506,822	15	\$19,658
Little Rock, Ark. ....	Hand			\$7,064
Springfield, O. ....	Hand	180,000	32	\$46,331
Galveston, Tex. ....	Both	650,000	12	
TACOMA, WASH. ....	Hand	1,500	18	\$35,137
Haverhill, Mass. ....	Both	270,000	47	26,520
Spokane, Wash. ....	Mach.	176,000	10	11,907
Terre Haute, Ind. ....	Both	500,000	31	14,014
Dubuque, Ia. ....	Hand	216,000	10	12,959
Quincy, Ill. ....	Both	†141,300	†6	3,074
South Bend, Ind. ....	Both	500,000	25	9,000

\* Cleaned occasionally by city prisoners. † No sweeping for 12 weeks. ‡ Including other street expenses.

inches in diameter. During the year just closed the gross earnings of the water plant were \$144,673.90, including an item of \$17,896.65 for water used by the city, while the cost of operation, repairs and maintenance amounted to \$32,806.50, leaving a balance for interest charges and depreciation of \$111,867.40; the interest charge of 5 per cent. on water bonds of \$1,509,322 amounts to \$75,466.10, leaving a net profit of \$36,401.40.

The lighting plant was also installed in 1884 and cost the original constructors \$250,000. With the added improvements it stands the city to-day the sum of \$415,943. The expenses of operation in 1901 were \$69,251.09 and the receipts \$106,414.15, including light furnished the city to the value of \$25,929.35. This left a balance of \$37,163.06 for interest and depreciation. As the interest charge is 5 per cent. on

\$415,943, amounting to \$20,797.15, this leaves a net profit for the year of \$16,395.91. The city uses 318 arc lamps on the streets, charging itself at the rate of \$6 per month each for them.

#### STREETS AND PAVING MATERIALS

Owing to the topographical situation the problem of street grading has been an interesting one in Tacoma, while the climatic conditions

#### STREET PAVEMENTS

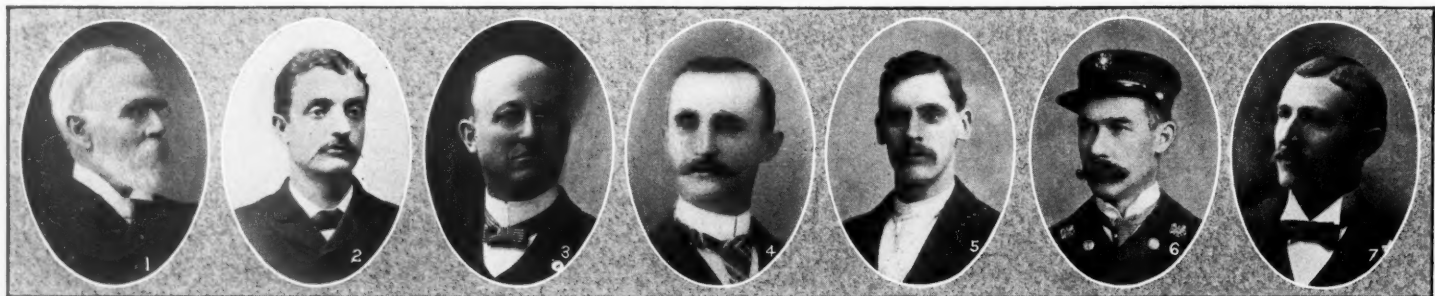
	Miles of street paved with				Total miles of streets	
	Granite and Belgian block.	Brick.	Asphalt and asphalt block.	Macadam.	Paved.	Unpaved
Altoona, Pa. ....	.94	1.04	6.49	1.30	10.40	85.20
Wheeling, W. Va. ....		23.00		6.70	38.70	31.20
Mobile, Ala. ....		.25		1.00	10.25	90.00
Birmingham, Ala. ....	2.01	.80	.10	36.70	39.61	126.27
Little Rock, Ark. ....	.75	2.00		5.02	53.87	184.63
Springfield, O. ....		5.92	.52		7.00	30.00
Galveston, Tex. ....		.50			9.50	130.00
TACOMA, WASH. ....		.06	1.64		18.50	111.61
Haverhill, Mass. ....	3.60			7.50	11.10	135.00
Spokane, Wash. ....		.20	2.90		20.10	255.00
Terre Haute, Ind. ....		4.42	3.64		10.49	190.00
Dubuque, Ia. ....		4.95		85.34	91.13	200.00
Quincy, Ill. ....		22.25		10.94	33.19	54.12
South Bend, Ind. ....		19.72	3.84		26.31	78.53

have made the kinds of paving materials used a matter of experiment to a large extent. The plateau on which most of the city is built rises somewhat abruptly from the filled-in lands along the water front. At the height of ninety feet a bench, or shoulder of the hill with a declination toward the south, forms the flat whereon the principal business part of the city is built. From this in turn the hill rises at an inclination of about fifteen degrees to the summit of the plateau, 300 feet above tide water, each of the longitudinal streets having been graded out of the hillside, forming miniature terraces as the ascent is made. The broad plateau on top is generally level, though in places deep gullies have been eroded as water courses for the rapid drainage of the hill in stormy weather.

There are 109 miles of graded streets within the corporate limits. Most of these, throughout the residence sections, are simply graded to the survey, the gravel deposit characteristic of this part of the Puget Sound country forming an excellent natural roadbed. During the so-called rainy season most of the falling water percolates readily through this deposit, the surplus being carried off by the ravines mentioned and by sewers constructed in the past ten years, so that in a few hours after a rain the streets are comparatively dry; at no time are the hill streets muddy.

In the business district most of the streets are floored with four-inch fir plank, laid diagonally so as to offer the greatest resistance to wear. Some of this planking has not been renewed for ten years and is still in fairly good condition, but on the lower streets and in the somewhat marshy section near the head of Commencement Bay the planks rot out every few years and have to be replaced. The cost for this kind of street improvement is light, however, and as the material is one of Washington's chief products its use is popular among the people.

On a few of the principal thoroughfares different kinds of paving material have been tested. In 1890 a portion of Tacoma avenue was paved with asphalt, 21,000 square yards being laid. Although twelve years have elapsed and the asphalt has been subjected to steady wear and tear, it is still in good condition, and from present indications will not need any considerable repair for many years to come. The next experiment made was in paving the lower part of Pacific



1. Rev. B. S. MacLafferty, D. D., City Librarian. 2. Dr. F. J. Schug, Health Commissioner. 3. Frank B. Cole, City Treasurer. 4. J. D. Whitehouse, Sec'y Chamber Commerce. 5. Alfred Lister, Controller. 6. J. C. Poyns, Chief, Fire Department. 7. Henry Mohr, Pres., Chamber Commerce.



## PROPERTY VALUATION AND TAX RATE

	Assessed valuation of property.		Tax rate per \$1,000.			
	Real.	Personal.	State.	County.	City.	Total.
Altoona, Pa. ....	\$16,075,175			\$5.00	\$7.50	\$18.50
Wheeling, W. Va. ....	18,124,341	\$5,559,191	\$3.50	5.00	6.00	18.90
Mobile, Ala. ....	11,339,608	4,646,593	5.50	4.50	6.00	26.50
Birmingham, Ala. ....	11,472,016	4,915,210	6.50	4.00	10.00	22.00
Little Rock, Ark. ....	9,713,768	5,131,690	5.50	6.00	5.50	22.00
Springfield, O. ....	11,653,580	6,249,515	2.90	3.64	9.90	23.10
Galveston, Tex. ....	22,337,090	4,368,188	3.47	6.80	15.70	29.97
TACOMA, WASH. ....	16,731,375	3,292,580	7.80	7.20	11.50	29.00
Haverhill, Mass. ....	20,604,310	5,839,623				17.40
Spokane, Wash. ....	17,098,792	2,380,940	6.63	7.37	15.00	37.00
Terre Haute, Ind. ....	15,064,540	5,349,350	2.97	5.00	11.40	25.20
Dubuque, Ia. ....	17,066,945	6,840,638	2.80	9.20	11.00	37.00
Quincy, Ill. ....	3,104,637	1,507,551	5.00	7.00	22.20	77.95
South Bend, Ind. ....	10,776,440	4,270,910	2.97	3.83	12.50	24.50

avenue in 1893, when 18,500 yards of bituminous rock\* (concrete) were put down under a five-year guarantee from the contractors. In far less than that time it was worn into a series of hollows and irregular patches. The contractors, at considerable expense, put it in good repair again, but its present condition is anything but commendable and it will soon need to be entirely relaid. It disintegrates and wears rapidly along the track of vehicles. It has given the best of satisfaction in neighboring cities.

In 1895, after considerable hesitation and a vast amount of figuring about the cost, the Council decided to experiment with fir blocks and ordered Pacific avenue, the main business street, paved with them for a distance of five-sevenths of a mile. The contractor who took the work, it may here be remarked, passed into the valley of financial shadow as the result, though at that time wages and material were alike much lower than at the present. A total of 27,000 square yards was laid, four-inch blocks being placed on a concrete foundation. After the lapse of a few years it was found that where these blocks were laid transversely, or at right angles to the street, they wore rapidly on the grain, but where they were set obliquely, as at street intersections, the per cent. of wear was much less. At the present time, after six years of wear, the fir block paving on the whole is practically worn out and has not answered fully the expectations of its advocates. Some allowance, of course, must be made for the decay of blocks that were evidently in poor condition when put down, while it is also alleged these blocks were not cut from the best quality

## PUBLIC PARKS AND SCHOOLS

	Parks.		Schools.		Main-tenance.
	Acres.	Main-tenance.	No. teachers.	No. pupils.	
Altoona, Pa. ....			12	155	\$87,130
Wheeling, W. Va. ....	30.51		11	148	101,920
Mobile, Ala. ....	5.00	\$1,688	11	78	
Birmingham, Ala. ....	20.00	1,570	8	94	27,926
Little Rock, Ark. ....	99.36		17	105	80,715
Springfield, O. ....	252.00	9,514	16	151	105,969
Galveston, Tex. ....	25.00		10	114	4,523
TACOMA, WASH. ....	698.00	7,237	19	180	5,682
Haverhill, Mass. ....	258.30	7,443	35	190	4,789
Spokane, Wash. ....	48.25	2,812	16	144	4,980
Terre Haute, Ind. ....	20.00	2,038	21	184	5,088
Dubuque, Ia. ....	6.00	1,275	19	136	3,943
Quincy, Ill. ....	102.70	3,823	13	114	3,618
South Bend, Ind. ....	15.13	4,874	10	109	3,611

\* Supported by state and county.

of fir in the first place. Another fault found with fir blocks is that in the dry season they shrink and become loose, while in the rainy season they swell and in places have practically dislodged the curbing from this cause. The difficulty, however, is easily obviated by street sprinkling in summer time and by flushing the street regularly from the fire hydrants, thus keeping the blocks thoroughly moistened. In 1899 there were 36,000 square yards of fir block paving laid on other and less traveled streets. This is still in first-class condition and as the wear is not over 33 per cent. as great as on Pacific avenue it promises to last for some years to come.

Tacoma's experience with fir block paving is that it is rather too soft for business streets, but is an ideal material for paving side and residence streets, as it is easy on the horses' feet, prevents slipping and gives a better appearance than any other sort of paving in use.

To a limited extent brick paving has also been tried, 700 yards having been laid on a side street some years ago. It has been somewhat chipped by travel, but on the whole is in good shape and gives fair satisfaction.

\* This as an asphaltic sandstone and should not be confounded with bituminous macadam, which is referred to elsewhere in this article. The sandstone is impregnated with an oily bitumen. It is similar to the bituminous stone found in some parts of Texas, Indian Territory and Kentucky.—[EDITOR.]

With the exception of the business streets, where concrete is used, all the sidewalks are of two-inch fir planking. The numerous bridges spanning the ravines are also built of the same material. All expenses for street improvements are assessed to the owners of abutting property.

## BRIDGE TO THE TIDE FLATS

In 1893 the growth of the manufacturing district convinced the taxpayers of the need of constructing a bridge to connect the tide flats with the city proper. They accordingly voted \$100,000 for this purpose, but it was over a year later before the structure was actually built. It has a total length of 1,100 feet, with a draw over the sea channel next the wharves of 250 feet, and stands 67 feet above low tide. It is a steel truss structure, erected by the King Bridge Company of Cleveland, O. The viaduct approaches are 700 feet in length. Two large caissons of wrought iron, filled with concrete, support the bridge on each side of the sea channel.

Another bridge, to cross the channel of the Puyallup river on the

## POLICE STATISTICS

	Police-men.	Licensed saloons.		Arrests for drunkenness.	Total arrests.	Cost of Main-tenance.
		No.	Amount license.			
Altoona, Pa. ....	19	49	\$500	652	1,148	\$17,104
Wheeling, W. Va. ....	34	116	650	735	1,705	27,927
Mobile, Ala. ....	55	165	*	954	5,200	35,300
Birmingham, Ala. ....	41	92	†	3,478	9,626	43,655
Little Rock, Ark. ....	35	67	360	853	5,189	30,988
Springfield, O. ....	33	142	350	353	1,456	23,180
Galveston, Tex. ....	42	216	†	456	2,583	
TACOMA, WASH. ....	34	98	500	597	3,667	32,040
Haverhill, Mass. ....	28	34	†	889	1,557	32,545
Spokane, Wash. ....	40	120	500	2,009	5,117	38,088
Terre Haute, Ind. ....	36	164	250	681	2,568	31,156
Dubuque, Ia. ....	39	140	600	697	1,064	28,001
Quincy, Ill. ....	29	132	500	180	717	20,555
South Bend, Ind. ....	23	123	200	413	889	21,336

\* \$25 to \$125. † Beer saloons, \$250; others, \$500. ‡ \$25 for malt, \$150 for alcoholic liquors. § Saloons, \$1,800; common victualers, \$2,000. a Including disturbing the peace.

tide flats, is to be erected during the coming summer. It will also have a draw so as to permit the free navigation of the channel.

## SEWERAGE SYSTEM

A complete sewerage system has been constructed since 1886, the pipes ranging in size from eight to fifteen inches. There are now over seventy miles of sewer pipe laid, six new ones having been built in the past year at a cost of \$29,995. The pipes for the system were all made by the Little Falls Clay Company, of Little Falls, Wash., and by the Denny Clay Company of Seattle.

The two departments of engineering and public works, while intimately connected, are yet essentially distinct. The engineer has full charge and control of preliminary work, with surveys, grades to be made, sewers constructed, estimates furnished, etc. Briefly, he is the consulting expert for the entire city. Mr. Norton L. Taylor is the present head of this department, with which he has been connected for some years, and has given a most excellent and economical administration, his efforts having achieved for the city engineering results that are of permanent and practical benefit. During the past year the cost of maintaining his office amounted to approximately \$7,000, but the importance of the work he has accomplished cannot be measured by this small sum.

The office of Commissioner of Public Works is one of the most important in the city, as it has full charge of all construction work, street and sewer improvement and maintenance and the operation of the light and water plants. Mr. R. W. Clark, the present incumbent, has brought to bear a practical knowledge to the duties of his office and has well conserved the city's interests.

## FIRE DEPARTMENT STATISTICS

	No. regulars.	Alarms.	Fires.	Property loss.	Cost of Main-tenance.
Altoona, Pa. ....	23	241	200	\$25,285	\$19,942
Wheeling, W. Va. ....	36	183	181	9,908	34,762
Mobile, Ala. ....	26	120	120		20,841
Birmingham, Ala. ....	31	248	236	130,416	33,729
Little Rock, Ark. ....	31	208	72		32,804
Springfield, O. ....	32	179	151	66,272	23,660
Galveston, Tex. ....	50	192	181		
TACOMA, WASH. ....	45	209	198	88,344	45,917
Haverhill, Mass. ....	25	267	132	106,213	51,268
Spokane, Wash. ....	63	234	141	133,565	66,814
Terre Haute, Ind. ....	51	177	170	20,624	40,475
Dubuque, Ia. ....	37	132	130		30,052
Quincy, Ill. ....	27	142	124	27,500	27,012
South Bend, Ind. ....	42	136	129	38,000	29,323



SHOWING THE CITY ON THE HEIGHTS

## DEPARTMENT EXPENSES

The cost of maintenance for the various departments last year is shown in the following table:

Mayor .....	\$1,750.00	Controller .....	\$4,215.84
Treasurer .....	4,084.07	Council .....	4,785.07
Clerk .....	4,962.19	Attorney .....	4,883.23
Commissioner Public		Engineer .....	7,258.86
Works .....	5,311.69	Building Inspector....	939.56
Police Court.....	1,430.08	Fire Department .....	48,501.97
Sewer Department....	12,387.82	Streets .....	25,851.79
Police .....	36,592.02	Health .....	7,238.28
City Hall.....	5,439.35	Library .....	8,060.11
Harbor .....	2,451.72		
Parks .....	10,354.38	Total.....	\$196,508.46

## PUBLIC SERVICE CORPORATIONS

The complaint is a common one in eastern cities that valuable franchises have been given away to private corporations without the people receiving any commensurate return. This can scarcely be said to be true of western municipalities, though in the hurry and bustle of city building it cannot be said the western people have given the subject the mature reflection that it seems to deserve. It must be remembered, however, that in most of the occidental towns public privileges were granted at a time when they numbered but a small population and when the applicants for a franchise took the chief element of risk, because the concession sought had then only a speculative value. Because of rapid growth and a marvelous material development, franchises in cities like Tacoma have become of great value *per se*, hence the justice of their paying a reasonable share of their earnings has long been recognized and incorporated into law.

At the present time the Tacoma Railway & Power Company, operating the consolidated street railway lines, is paying to the city one-tenth of one per cent. on its gross income, and the scale is so adjusted that at the expiration of five years it will be paying 5 per cent. on its gross income, thus yielding a handsome revenue for the street privileges it enjoys. This company also pays all cost of paving between its tracks and bears half the expense of bridge construction and repairs on streets where its lines operate. All cars are run by electricity excepting a single loop of cable that goes from the business center to the summit of the hill. There are now seventy-

two miles of street railway in operation, all the principal suburban points being connected with Tacoma by electric roads. An electric line, built by a separate company, is also being constructed to Seattle and will be in operation during the present year.

The Sunset Telephone Company, which operates in all the cities west of the Rockies and has connecting long distance lines between them, possesses a monopoly of the telephone business in Tacoma. Its rates are so low, and the service rendered is so much appreciated, that 3,700 telephones are now in use among the citizens. The express system of switches is used and gives the best of satisfaction. Last year the wires of this company, by order of the Council, were all placed underground on the business streets and on the main "leads" to the residence sections, but in other parts of they are still strung on poles. Both the Western Union and Postal Telegraph companies still use the overhead wires, but the underground system gives such general satisfaction that it is likely to be enforced soon on all companies. In lieu of a franchise tax, the telephone company furnishes free service to the various city departments.

Another corporation that deserves some reference is the Tacoma Cataract Company, which receives its power from the big electrical generator at Snoqualmie Falls, forty miles distant. This company provides motive power for a number of manufacturing concerns and



A GLIMPSE OF WRIGHT PARK

at the present time is offering to furnish current to the city at a cheaper rate than the city can produce it. At least, its advocates claim this to be true, though strong opposition has developed to the acceptance of the offer. A franchise tax is paid amounting to 1 per cent. on the gross annual receipts.

## PUBLIC HEALTH IS CONSERVED

The public health is looked after with the greatest care. Sanitary regulations are strictly enforced, while the climatic conditions and physical features conduce to a general healthfulness. Because of its situation on the isothermal line of 50 degrees, and because of its immunity from sudden changes of temperature, diseases due to extremes of heat and cold are entirely absent, while malarial and zymotic epidemics are unknown. There is no enervating heat in summer or depressing cold in winter. So low is the death rate that Tacoma is named as one of the healthiest cities in the United States.

A somewhat remarkable fact, and one that has excited the attention of medical authorities everywhere, is that the few infectious or contagious diseases developed in the Puget Sound country are of an extremely mild type, the virulent character that marks their course elsewhere being almost entirely absent. Smallpox, for instance, so deadly a disease in many sections, is rarely fatal here and simply develops a slight rash, leaving the patient free from the marks so characteristic of this dreaded malady. Even this mild form seldom occurs, the efficiency of the health department preventing its intro-



A QUIET DRIVE IN POINT DEFIANCE PARK



duction. An explanation of this freedom from epidemical diseases is that the germs are destroyed or rendered innocuous by the remarkably pure atmosphere.

The fine sewerage system of Tacoma, and the manner of administering the health laws, account also for the healthful condition of the city. Filthy quarters are not tolerated; the streets and alleys are cleaned regularly and the few marshy sections are thoroughly drained. Garbage is burned at a public crematory or consigned to the purifying agency of Puget Sound. Dr. F. J. Schug, the Commissioner of Health, has been at the head of this department for several years. He is assisted by a board comprised of city officials and has a deputy who sees to the observance of sanitary regulations. The inspection of milk, butter, fruit and food products generally is performed by state deputies and does not come within the province of the local board, though assisting powerfully in preserving the general health.

#### PARKS AND PUBLIC BUILDINGS

In the extent and beauty of its public parks no other city in the northwest can rival Tacoma, for here due consideration has been given to the artistic as well as the material development. Her splendid residence streets, magnificent parks and imposing public buildings are a delight to all visitors.

The mild climate permits of outdoor adornment to an extent unknown in the east. There is scarcely a residence that does not have its plot of ground, large or small, embowered in flowers and shrubbery, while the lawns retain their green verdure the year around. In consistently aiding the gifts of nature, the efforts of man have

ton. Wright Park represents the best handiwork of landscape gardeners and on account of its proximity to the business center is a favorite retreat for all citizens. A number of fine statues adorn this beautiful field and the ceremony of the rose carnival and many other public demonstrations are annually held there.

McKinley Park, near the head of Commencement Bay and overlooking that vessel-trod harbor, contains twenty-two acres. It is only partly improved, but the design is to make it equal in adornment and picturesque beauty to Wright Park and considerable work will be done upon it during the present year. Two smaller parks, aggregating nineteen acres, are also owned by the city, but thus far have only been partially cleared. South of the city stretches the wonderful natural park region of the gravel prairies. It is covered with grass and dotted with clumps of a varied evergreen growth. Several magnificent fresh water lakes are found in it, the most available having been turned into enticing summer resorts. This park region is intersected by roads that are like boulevards and it is also traversed by bicycle paths. The golf links, covering 140 acres, are on the edge of this prairie adjoining the city. Within the corporate limits there are also twenty-eight miles of cinder bicycle paths, radiating to all parts of the residence sections and connecting with nearby towns.

In public buildings the City Hall and Pierce County Court House are notable examples of architecture. The Carnegie Library, now being built, is also a handsome structure. It is the gift of the noted steel magnate and will cost \$75,000. There are also twenty-two imposing public school buildings, five college buildings, sixty-nine church edifices, two armory buildings and two general hospitals.



IN THE DEER COMPOUND, POINT DEFIANCE PARK

been directed toward intensifying the beauty of the surroundings. Both the civic corporation and the citizens individually are working toward a common object, and are as proud of Tacoma's title of being a superb home city as they are of her unparalleled progress in commerce and manufacturing.

There are five parks owned by the city. The largest of these, Point Defiance Park, contains 631 acres and lies to the north, occupying the apex of the peninsula on which the city is built. This park still contains considerable virgin forest, but shady walks penetrate it in all directions and about 100 acres have been transformed into a veritable fairyland. Its wild natural beauty has not been sacrificed, but every curious or fantastic growth, every marked topographical feature has been preserved and utilized to add to its attractions. It is under the charge of a skilful forester, who has made it one of the most beautiful spots in all America. Elk, deer, bear and other animals are kept in part of this park and are an interesting feature, while a garden with 150,000 rose bushes and several acres devoted to other floral favorites give a most pleasing effect during the season of bloom.

Wright Park, located in the heart of the city, contains twenty-six acres, all improved. It has an artificial lake spanned by a rustic bridge; flowers in profusion bloom within its borders, special prominence being given to the rhododendron, the state flower of Washing-

A Chamber of Commerce, of which Henry Mohr is president and J. S. Whitehouse secretary, comprises in its membership the leading business and professional men of the community. It has exerted a great potential power for the upbuilding of the city and is indefatigable in its efforts to place before the people of the country the superior natural resources possessed by Tacoma. The Chamber of Commerce is housed in its own building, one of the finest business blocks in the west.

#### A GOOD FIRE DEPARTMENT

During the past year there were 229 fires, involving property valued at \$1,322,000. The fact that the fire losses for the entire year only footed up \$44,963 indicates the efficiency and thorough organization of the department that looks after this branch of the public safety.

The fire department numbers fifty men under the chieftainship of Jesse C. Poyns, who has held the office continuously for four years and who is noted as one of the best fire fighters in the northwest. Previous to his selection for this important post Chief Poyns was assistant chief.

There are seven department houses located throughout the city, due consideration having been given to the protection of all sections. These include three engine companies, three hose companies and a

continued engine and hook and ladder company. A chemical engine is also in commission at one of the stations. In addition to these, the equipment includes two reserve engines and three reserve chemicals, not now in commission. There are 380 hydrants, having a pressure on top of the hill of thirty pounds and increasing to a pressure of 192 pounds at the tide flats. The signals in use are furnished by the Gamewell Fire Alarm Telegraph Company of New York and includes a receiving and transmitting system. There are fifty-seven alarm boxes. The cost of maintenance for the department during the year was \$48,501.97.

#### CRIMINALS AVOID THE CITY

There are two reasons why Tacoma is such an orderly city. One is because it is thoroughly American, only a small foreign element being present, and hence the people have a higher standard of intelligence and a higher conception of their duties as citizens than in many other communities; the other reason is because there is no "tough quarter," properly so called, such as distinguishes the "Barbary Coast" of San Francisco or the "Whitechapel" district of

Seattle, where criminals congregate and vice flourishes. The policing of the city is therefore a comparatively easy matter, though a limited force is maintained to protect property rights from the depredations of wandering lawbreakers. The ability of the force and the condign punishment that is meted out to men convicted of crime has taught this class to entertain for Tacoma a wholesome respect and they usually give it a wide berth. A patrol wagon, and an ambulance presented by the citizens, are operated by the department, the Gamewell Police Alarm Telegraph system being used for calls and for the hourly reports sent in by patrolmen.

As a municipality, Tacoma is still in the formative stage. The foundation has been laid, broad and strong, and riveted to a solid bedrock of fundamental law. At present the superstructure is being builded, surpassing in its completeness the glittering promises of the early days and the most sanguine hopes of its promoters. Tacoma has survived the ills of childhood and now, a lusty youth, is supported by an immense array of natural resources and advantages for the chieftainship of the Pacific Coast in finance, commerce and manufactures. It is Tacoma's destiny to achieve it.

## THE GROWING POPULARITY OF BITUMINOUS MACADAM

It Is Called the Ideal Pavement—Commended by City Officials, the General Public and the Press—Many Contracts Awarded for the Coming Season—It Is Worth a Careful Examination

By Walter J. Somers, C. E.

THERE are pavements and pavements, but none which possesses all the merits of the ideal. At least that has been the common verdict up to the present time. While many good pavements have been laid and are well known, yet every one of them has some fault or faults which remove it beyond the realm of the ideal. Last season, however, there was introduced in several New England and Eastern cities a form of pavement known as Bituminous Macadam, which possesses all the characteristics of an ideal pavement—smoothness, sure footing to horses, and durability. If the favorable reports which come from the cities that introduced this form of pavement last season are to be believed—and there is no good reason why they should not be—it would seem as if the ideal pavement had at last been discovered. As the MUNICIPAL JOURNAL AND ENGINEER has devoted considerable space to a faithful description of this pavement and its manner of construction, and as there is a vital interest in the general subject, it occurs to me there could be no more valuable matter placed before your readers than a lucid and fair description of the experience of those cities which introduced the pavement last season and the opinion of various experts who have examined it carefully. For this reason I have obtained the reports from several of the New England cities which laid a section of the pavement, and will quote that portion relating to the pavement in question.

#### CITY OFFICIALS TALK ABOUT THE PAVEMENT

The city officials of Pawtucket, R. I., were confronted early last season with a serious problem in connection with the improvements of various streets. "While we were at work upon the investigation of this problem," said the chairman of the Board of Public Works in his last report, "a company was organized in Boston, from men of large experience in asphalt business, to construct bituminous roadways. Conferences with these gentlemen resulted in the laying of this kind of road surface on two streets in this city that were then being repaired, on Park Place from Main street easterly to the east end of Wilkinson Park, and on Harvey street from East avenue to Pleasant street.

"The wearing surface of these two streets has been more carefully proportioned and more attention has been paid to the character of the materials which entered into its composition than was the case with the early experiments.

"The theory is, that such a proportioning of the sand and bituminous cement with trap rock of suitable size as will fill all the voids, permits the use of bitumen with a larger percentage of oil, thereby increasing the life of the binder and the consequent durability of the pavement. The trap rock furnishes the wearing surface and the bitumen and sand form the binder for this rock.

"The two streets resurfaced in this manner present a very attractive form of pavement which may be said to occupy a place midway between macadam and asphalt, and numerous city officials from various sections of the country have visited Pawtucket to inspect this work.

"It is, of course, true that time alone can answer the question of durability satisfactorily, but our past experience with pavements of this kind in the construction of which less care was used in selecting materials and properly mixing the same, certainly justifies further investigation and warrants the belief that better results than have yet been attained may be expected."

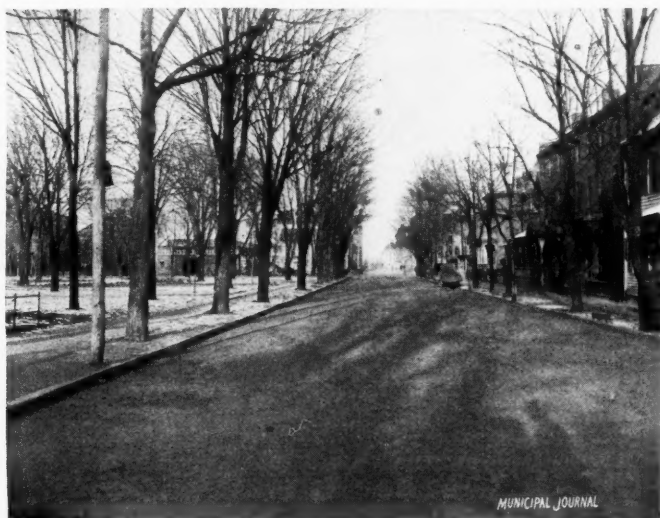


MAPLE STREET, HOLYOKE, MASS., BEFORE IMPROVEMENT



## CITY ENGINEER OF EVERETT

The City Engineer of Everett, Mass., in his annual report, says:  
 "In October, 1901, the street committee of seven members visited Lowell, through the kindness of Mr. Fred. J. Warren, President of



MAPLE STREET, HOLYOKE, MASS., AFTER IMPROVEMENT

the firm of Warren Bros. Company of Boston, to inspect the bituminous macadam pavement laid on one of the principal thoroughfares.

"I believe that this pavement is something that every city engineer should interest himself in, to the extent of recommending to the city authorities a practical demonstration of its durable qualities. To my mind it is far superior to asphalt, inasmuch that firmer footing to horses is assured, and in the matter of first cost, is undoubtedly less expensive than any other form of pavement now before the market; easy of repair and maintained at a small cost, which is an important element, comparatively speaking.

"From observation and testimony, the committee was well pleased by the evidence obtained through the Lowell authorities.

"Provision should be made to carry on further investigations of this nature in the interest of so important a subject."

A stretch of this new pavement was laid in Holyoke, Mass., last season, in commenting upon which the Board of Public Works, in its annual report, said: "A stretch of bituminous macadam was laid this season on Maple street between Dwight and Hampden streets, and it has proven very satisfactory thus far. Should the street stand the traffic well through the winter we shall be favorable to the further use of this material in the city."

The Superintendent of Streets of Brockton, Mass., had a section of this pavement laid in that city last season, and in referring to it in his report he says that in his opinion it is the cheapest and best of any known pavement.

SUPERINTENDENT BROWN OF CAMBRIDGE

Superintendent of Streets Brown, of Cambridge, Mass., introduced this new form of pavement in his city also. In referring to the subject in his annual report for 1901 he said:

"There are throughout the city a large number of residential streets, where the traffic is comparatively light, and where a smooth

and, so far as possible, noiseless pavement is desirable. A recent improvement in street construction known as waterproof bituminous macadam has been brought to our attention, and as an experiment, Temple street has been paved with it. The illustrations in this report give an idea of its construction and appearance, and a description of the method may not be uninteresting.

"The foundation consists of four inches of crushed stone laid and rolled in the same manner as ordinary macadam. Over this is laid two layers of bituminous cement, for the purpose of firmly holding the foundation and uniting it to the wearing surface. The wearing surface, which is two inches thick, contains all the ingredients of a stone macadam surface, i. e., stone varying in size from about two inches to a fine powder. The particles of stone are carefully proportioned as to size to give the greatest possible density and least voids and are heated and mixed by machinery with the bituminous cement. The mixture is then hauled to the street and while still hot spread on the foundation so as to give a uniform thickness and grade, and rolled with a heavy steam road roller. The roller used here weighs sixteen tons.

"The pavement when completed presents a surface similar to, and affording the foothold of, macadam, but the particles of stone are held firmly together by bituminous cement similar to the ordinary asphalt pavement, which is made of sand and bitumen.

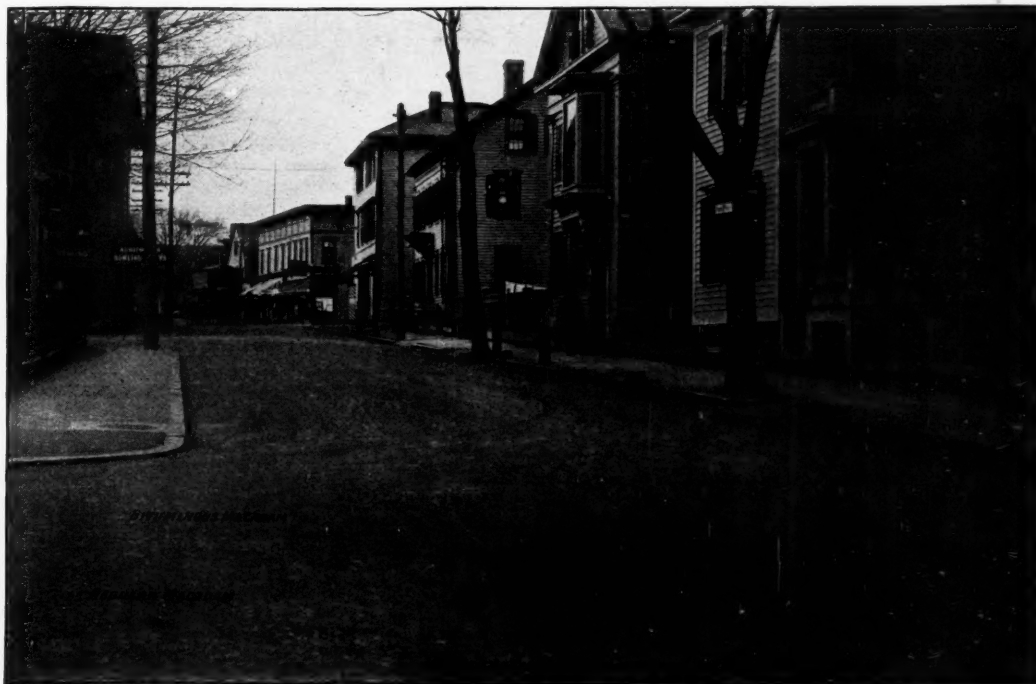
"Asphalt" is a bituminous mortar pavement (bitumen and sand). Bituminous macadam is a bituminous concrete (bitumen, sand and hard stone). It therefore combines the advantages of asphalt and macadam, and overcomes most of the objections to each, such as: first, slipperiness and liability of the asphalt to crack and disintegrate; second, the mud, dust, rapid wear, washing out and unsanitary features of the macadam.

"In addition, it gives a more solid and dense and, therefore, more waterproof and durable wearing surface than either asphalt or macadam.

"By some of the best road builders of the country this new pavement is regarded as the best, considering its cost, that has yet been devised, and if its durability can be demonstrated, it may be used to great advantage on streets such as have been indicated."

## THE GENERAL PUBLIC ENDORSES IT

As there are intelligent citizens who are interested in the general subject of paving, an expression from citizens of different cities will not be without its practical value upon this question. For this reason I took the trouble to obtain an expression from a majority of the



BITUMINOUS MACADAM PAVEMENT ON PARK PLACE, PAWTUCKET, R. I.

residents living on Maple street in Holyoke, Mass. The following statement was presented to them in person:

"We, the undersigned, residents and property owners on Maple street in the city of Holyoke, Mass., do hereby express our appreciation of the merits of the Bituminous Macadam pavement laid on



FINISHED BITUMINOUS MACADAM PAVEMENT IN CAMBRIDGE, MASS.

said street by the Warren Bros. Company, of Cambridge, Mass. The pavement is smooth, it is noiseless, it is cleanly, and it gives a sure footing for horses. It is one of the very best pavements in our city and we consider it perfect as regards our requirements. We have in use in Holyoke nearly all kinds of pavements, including brick, granite blocks, asphalt blocks and macadam."

This proposition was signed by nearly all of the property owners living on Maple street and was presented to them last month. The same proposition was presented to the property owners living on Walnut street in Salem, N. J., last February, where a section of the street had been paved with Bituminous Macadam, and it met with the same popular approval.

#### MANY CONTRACTS AWARDED FOR THIS SEASON

This new form of pavement has excited such popularity and interest in New England particularly, that many New England cities have already determined to lay some of this pavement during the coming season. Superintendent of Streets Thurston, of Fall River, Mass., has been so favorably impressed that he has recommended the laying of this pavement on several streets during the coming season. In his annual report touching the matter, he remarks: "A new pavement has been put upon the market and introduced in a number of neighboring cities, Brockton, New Bedford, Lowell and Cambridge, known as Bituminous Macadam. It consists of a foundation of crushed stone about four inches in depth rolled in the same manner as ordinary macadam. Over this is spread layers of bituminous cement for the purpose of holding the foundation and uniting it with the wearing surface. The wearing surface consists of about two inches of stone varying in size from chestnut to a fine powder, carefully pro-

portioned in order to give as great a compactness as possible and the least number of voids, heated and thoroughly mixed with bituminous cement, and rolled by a heavy steam road roller.

"The advantages claimed for this pavement are that it is waterproof, its surface affords an excellent foothold for horses, there is no dust or mud, it is comparatively noiseless, not so slippery as asphalt and has none of the unsanitary features of macadam.

"After communicating with the above named cities I feel fully convinced of the merits of this pavement and do recommend that our city lay some the coming year."

#### COMMENDATORY WORDS FROM THE PRESS

The opinion of the daily press, when it is unsolicited, as it has been in the following instances, is not without its value in judging of the merits of any public improvement. Newspaper men have a wide and general information about municipal affairs; in many instances greater than that possessed by some city officials in authority. This fact gives the newspaper opinions the greater weight. A score or more of quotations could be made from well known and reliable newspapers throughout the country, but none will have greater weight with the average reader than that contained in the paragraph taken from the "old and reliable" New York Tribune, tri-weekly edition of February 10, 1902, which reads as follows:

"By the use of carefully and scientifically prepared bituminous cements, skilfully mixed with crushed stone under the direction of men who have had years of practical experience in handling bituminous materials suitable for street pavements, a great improvement is made over the ordinary method employed in constructing macadam roads.

"The advantages of bituminous macadam properly constructed are its durability, its being impervious to water, frost proof in winter, and preventing mud, dust and loose stones in summer. It makes a clean, comparatively noiseless and attractive roadway, while the ordinary macadam road in general use in this country soon wears badly under traffic, making mud or dust, and soon allows the stones to loosen.

"A bituminous macadam road is waterproof. It does not absorb the filth of the street and prevents the washing by heavy rains to which the ordinary macadam road is subject.

"Good and uniform results cannot be obtained by the use of common coal tar obtained from gas works in different sections of the country. In fact, it is impossible to secure a bituminous cement from



LAYING THE PAVEMENT ON PARK PLACE, PAWTUCKET, R. I.



the products of the average gas works which will produce good results.

"The construction of this form of roadway demands the services of experts in this line of work. The ordinary coal tar has been tried repeatedly during the last thirty years. With a very few exceptions it has been a total failure. The crown of a road when finished may vary on different roads, or even on different grades of the same road, from one-half to one inch to the foot. Of course, no inflexible data can be given for the width, crown, thickness or cost of a road until the requirements of that special road are known.

"Where the travel is light a good road can be built with six inches of gravel and a light coat of crushed stone placed on top. This works well on a steep grade."

The *Indianapolis News* of February 28, 1902, in an editorial, reports that:

"Indianapolis will try a new pavement, Bituminous Macadam. To-day the Board of Works adopted a resolution to pave Southeastern avenue from State avenue to Rural street with this material. City Engineer Nelson says it has been used recently in several Eastern cities and is being pushed by the Warrens, who were formerly the Warren-Scharf Asphalt Company. The chief engineer says Bituminous Macadam is composed of sand, gravel, stone and tar, and is something like vulcanite, which was used in a little pavement in Indianapolis a few years ago. The estimated cost per square yard is less than the cost of asphalt."

The *Morning Sun* of Norwich, N. Y., reports that a contract has been awarded for a Bituminous Macadam pavement to be laid in that city some time during the coming season. From the *Evening Star* of Washington, D. C., I take the following news item, which speaks for itself:

"The District Commissioners have decided to test an area of at least two squares of a new style of pavement known as Bituminous Macadam. Mr. A. W. Dow, the inspector of asphalts and cements, has recently returned from Charleston, S. C., where he went to examine into the merits of the new pavement, and has submitted a favorable report to the engineer commissioner.

"The completed pavement is very hard and compact, and can be driven over with a heavy load immediately after completion without showing the slightest marking.

"This pavement gives promise of being one of the most successful constructions that has ever been attempted in road building. The use of the large stone, with just sufficient small material to give a minimum of voids gives such rigidity that a very soft bituminous cement can be employed as the binding material. For this reason the life of such a pavement is entirely dependent on the wearing of the stone used, as the bituminous cement used, if of fairly good quality, is so soft as to retain its life for thirty years or more."

The favorable comment and approval which is given the bituminous macadam pavement by high class engineers, city officials and taxpayers is unprecedented in the paving industry. There is scarcely a city in the North, East, South or West of any considerable size which has not already contracted for, or has in contemplation the laying of one or more streets of Bituminous Macadam pavement. Its fame has been extended across the Atlantic, for I have read extensive accounts of the laying of this pavement in American cities in many English journals. This pavement is protected by Letters Patent and makes one of the most valuable contributions of the new century. As a matter of fact too much cannot be said in its favor, especially when the views of such experts as Prof. A. W. Dow, of Washington, D. C., and many city engineers throughout the country are taken into consideration.

## SUGGESTIONS FOR TRANSPLANTING AND CARING FOR TREES

Tree Culture Clubs Should Be Organized—Points to Consider in Selection—Care and Protection When, Where and How to Plant—General Points to Be Considered

By Lewis Collins \*

THE residents of every city block, town or village would do well to organize a club for the promotion of tree culture. After such an organization has been effected and after the local conditions have been carefully surveyed, it should be determined what trees should be saved and what ones should be removed. Then those worth saving should be trimmed and guarded, while new trees should be planted in the places of the sickly, deformed or injured trees. All the residents should feel that they have an interest in every tree. Every one should be willing to sacrifice individual interest for general welfare. People would learn to say of trees thus planted and protected, not "my trees," but "our trees"; a sense of common property, a common interest, a common guardianship would prevail. When once in operation the beneficent results of such an organization would insure its continuance.

### THE SELECTION OF THE TREE

It should have an abundance of roots. The roots sustain the life of a tree. There should be plenty of them, compactly grown within a small compass, and they should not be stripped of their bark or torn at their ends or dried up.

It should have a normal form and well-proportioned development of shaft and crown. The shaft should be clean and straight, neither thick-set and short, nor thread-like and over elongated, but gradually tapering and strong enough to hold up its head without support. The normal crown is characterized by vigorous, full-sized leaves, if in leaf, or by a large number of thick and full buds; it covers the main stem one-third to one-half of its length with a symmetric spread evenly branched, and has only one leader of moderate length.

The length and vigor of last year's shoots, number and thickness of

buds and appearance of the bark afford means of judging the healthy constitution of trees.

### TREATMENT BEFORE TRANSPLANTING

Transplanting is at best a forcible operation; and injury to the roots, although it may be small, is almost unavoidable. The roots are the life of the tree and need the most attention. In taking up a tree for transplanting the greatest care must be exercised to secure as much of the root system intact as possible.

A healthy looking tree may have the certainty of death in it if the root fibres are dried out. To prevent drying during transportation cover the roots with moist straw or moss or bags, or, if practicable, leave on them as much soil of the original bed as possible. This is not intended to apply to nurserymen in preparing trees for shipment. At the place where the tree is to be planted, if the planting cannot be done at once, "heel in" the roots; that is, cover them and part of the lower stem with fresh earth, or place the tree in the plant hole, throwing several spadefuls of earth on the roots.

Pruning roots and branches is almost always necessary, but must be done with great care, especially as to root pruning. The cutting at the roots should be as little as possible, only removing with a clean sharp cut the bruised and broken parts. Extra long tap roots may be cut away, but all the small roots should be preserved. The cutting of the tap is done to bring crown and root into proportion; the more loss at the root system has been experienced the more need of reducing the crown system; larger trees, therefore, require mostly severer pruning, especially on poor soil; yet if there be fibrous roots enough to sustain great evaporation from the crown the less cut the better. With large trees severe pruning is less dangerous than too little. A clean cut as close as possible to the stem or remaining

\* Secretary of the Tree Planting and Fountain Society of Brooklyn, N. Y.

branch will facilitate the healing of the wound. No stumps should be left (this applies to deciduous trees and not to conifers). Shortening of the end shoots to one-half or two-thirds of their length may be done a little above a bud which is to take the lead. As a rule, the pruning for symmetry should have been done a year or so before transplanting, but may be done a year after.

#### SOIL, ROOTS AND PLANTING

The soil where the tree is to be planted should be examined by a competent person to determine whether or not it is suitable for tree growth. If it is not, the poor earth should be removed and good soil substituted. Plenty of good soil is necessary to successful tree culture. The soil should be good to the depth of from three to four feet, and an equal distance in all directions from the trunk of the tree when practicable. The quantity of good soil is more important than the shape it is in.

When the soil is good deep down, roots will naturally penetrate the earth and remain out of sight and out of the way. But if the soil below is poor the roots will rise to the surface and spread over a large space in search of nourishment. This condition is very objectionable and should be guarded against. A few varieties incline to send roots near the surface.

Planting is best done by two or three persons. One, who manipulates the tree, is the planter and responsible for the result; the others do the spading under his direction. If the root system is developed sideways but not centrally, as is often the case, a hill should be raised in the hole to fill out the vacant space in the root system; the earth of the hill should be pressed down to prevent settling. When the hole is in order the planter holds the tree in the proper place. The others spread the roots into a natural position, then fill in the soil, using the good soil first—small spadefuls deliberately thrown over the roots in all directions—while the planter, by a slight shaking and pumping up and down of the stem, aids the earth in settling around the rootlets. A close contact of the soil with the rootlets is the secret of success in planting. Only fine, mellow soil, not too moist, and free from stones, will permit such close adjustment to the rootlets, which should also be aided by hand and fingers filling in every crevice. The planter, while setting the tree, must exercise care to keep it in proper position and vertical until the soil is packed so as to keep it in place; then the others rapidly fill the hole, the planter treading down the soil firmly after a sufficient quantity is filled in, finishing off a little above the general level to allow for settling. Great care should be taken to keep the tree plumb.

#### CARE OF THE TREE

The practice of using water while planting can hardly be said to be a good one, unless the water is very carefully applied with a "rose" after the soil is well filled in and packed around the fibrous roots; especially with a soil which has a tendency to clog there is great danger of an uneven distribution and settling, with consequent empty spaces between the roots. More trees are probably killed by too much water in transplanting than by too little. Water after transplanting (and perhaps before the last shovels of earth are filled in), especially if the soil was dry, is useful and should be applied during the hot season, choosing the late afternoon or evening for applying it. Trees planted very late in the season require greater care and more water than those set earlier.

Keeping the ground around the tree free from weeds and grass, and preventing it from baking, by occasional hoeing and raking, is advisable. To prevent the tree from being swayed by the wind, if of large size, they should be staked firmly; a loose post is worse than none. The tying should be so done as not to cut or injure the tree; a tree box insures more safety against accidents. With the development of the crown it becomes necessary to trim it so as to carry the top above reach. Trees should not be used as hitching posts, nor should children be allowed to disturb them or in any way meddle with them.

#### SIZE AND TIME TO PLANT TREES

Spring, after the frost is well out of the ground and before the

juds open, is, as a rule, the best time for transplanting, although with care it can be done all the year round. A murky or cloudy day is preferable to a sunny one for that operation. In autumn, after the leaves fall, is the next best time. Some maintain that autumn is as favorable as spring. The period in which transplanting may be done is longer in the fall than in spring and work is not so pressing, and besides, preparation may be made during the summer when labor is abundant.

Although as a rule small trees have a better promise of success, other considerations recommend the choice of larger sizes for streets and ornamental planting. Trees of any size can be successfully transplanted, but in proportion to the size grows the difficulty, the amount of work and the care necessary. As a rule the largest size should not exceed from two to three inches in diameter near the base, nor from ten to fifteen feet in height. The variety of the tree should be considered in selecting the size. There are kinds that will not succeed well unless transplanted while smaller. Mainly such as have soft spongy roots, as the tulip and the chestnut.

#### SELECTION OF VARIETIES

In selecting the variety of tree to plant one should take in consideration the surrounding conditions. The quantity of soil available for the roots should be determined and its quality examined, whether it is good or poor, heavy or light, wet or dry. The width of the street, kind of pavement, width of sidewalk, amount covered and amount uncovered, material used for walks, whether the buildings are placed on the building line or set back from it, and if so, how far; the amount of dust likely to be raised, the condition of the atmosphere, whether it is vitiated with gases and smoke from manufacturing in the vicinity, the grade of the street; steep grades allow water to run off quickly, giving little time for it to soak into the ground; exposure to raking winds and other conditions should receive attention to secure the best result.

It will be seen that to make the best selection one must have a knowledge of the requirements of different varieties of trees and their adaptability to existing conditions.

It is desirable to have as great a number of varieties used for streets as practicable. We could do more to beautify our city by exercising a great range of choice as to the trees placed in the streets.

#### DISTANCE APART TO PLANT TREES

Trees should be placed so far from each other that at maturity they will not meet. Such distance will enable them to develop in their natural beauty, give them sufficient space to be vigorous, allow the sun to shine on the ground under and between them a portion of every day, driving away malaria and enabling grass to grow and so increase healthfulness and beauty. Trees placed at such distances allow architecture to show to better advantage and present the pleasing combination of sunshine and shadow on the ground. To determine the distance to intervene between trees measure the spread of full-grown trees of the same variety as those to be planted, and let this measurement be taken. It will vary from 30 to 80 feet. In narrow streets they should be double these distances apart and should alternate on opposite sides of the street.

#### PROTECTION OF TREES

Protection of trees may be divided into two parts, supporting and guarding from injury. A tree when planted should be supported in an erect position until its roots have taken a firm hold upon the ground and are able to hold the tree in an erect position. This will take several years, the time depending upon circumstances. After that the tree will be able to support a guard. All young trees when transplanted require a support; only such as are exposed to danger require a guard. That proper support has not been supplied is proved by the great number of leaning trees in the city. That the guarding has not been well done is proved by the great number of trees that have been injured, many of them beyond the possibility of recovery. This subject deserves careful attention. Very few satisfactory supports have been presented. There is a large number of efficient guards if they are properly applied.





## ROAD BUILDING IN GEORGIA

First Good Roads Built in 1829 by Slaves—Many Toll Roads, Built Before the War, Now Abandoned—Convict Labor Used to Good Advantage—Macadam, Chert and Rubble Stone Roads Built—This State Leads the South in Betterment of Highways

By S. W. McCallie \*

THE first important legislative enactment of Georgia looking to the improvement of the highways may be said to date from 1829. During the latter part of this year an act was passed by the General



CONVICTS BUILDING ROAD NEAR SAVANNAH, GA.

Assembly appropriating \$70,000 for the purchase of negroes to be used in improving the highways and navigable streams. A large number of slaves were thus procured by the State and placed in charge of two superintendents appointed by the Governor. The duty of the superintendents was to direct and oversee all improvements and make annual reports to the General Assembly, describing the nature of the work performed, and the cost of the same. The movement inaugurated under this enactment began under very favorable auspices, and the necessary appropriations were willingly voted from year to year to carry on the work.

### FIRST GOOD ROADS BUILT BY SLAVES

In a short time, however, dissensions arose. It was claimed that the works were poorly managed; and furthermore, that a few localities, only, were being benefited at the expense of the entire State. Influences were accordingly brought to bear upon the Legislature,

\* Assistant State Geologist, Atlanta, Ga.

and the appropriation was discontinued after the expenditure of about \$200,000. The superintendents reported about 200 miles of road built, mostly in the vicinity of Macon, Milledgeville and Augusta, during the time the law was in force.

Hardly had the above plan of road improvement passed into disfavor, when there was much interest shown in highway improvement throughout the state by the building of turnpikes. Between 1834 and 1850, the General Assembly incorporated no less than twenty-five companies for the purpose of building such roads. The majority of these charters were for roads to be constructed in the northern part of the state, where the mountainous nature of the country rendered the building and maintenance of roads especially expensive. Various schemes were adopted to secure money to build the turnpikes, the most common being the selling of stock, the instituting of lotteries, and the application to the Legislature for state aid. In a few instances the state granted small sums for such improvement; but in the majority of cases the turnpikes were opened and kept in passable condition by stock companies. Some of these roads were of plank, but as a general rule they consisted of common dirt roads kept in fair condition for travel by the employment of hired labor.

With only one or two exceptions, the charters for turnpikes ex-



GRAVEL ROAD NEAR AUGUSTA, GA.—COST \$1,600 PER MILE

pired or were recalled before the Civil War, and no effort has since been made to revive the system of toll-roads. Subsequent to the Civil War there has been no marked or very sudden change toward the betterment of the public roads of the state; yet, during this time there has been a gradual, growing sentiment in that direction.

### THE "NEW ROAD LAW"

One of the most effective means brought about in the last few years looking to the improvement of the highways, has been the adoption of the so-called "new road law." This law inaugurated in 1891, authorized the commissioners of roads and revenues of each county, upon the recommendation of the grand jury, to fix and levy a special road-tax, not to exceed two mills on the dollar, and also to exact of each male inhabitant a commutation-tax not to exceed fifty cents per day, for the number of days work is required. Furthermore, the law authorized these road authorities to organize chain-gangs of misdemeanor convicts, or to hire free labor for the improvement and maintenance of the highways, the expense being met by the special road and commutation taxes. About one-fourth of the counties of the state have since adopted this new road law, and are now keeping up and improving their highways either partially, or wholly, by hired



KELLY ROAD ROLLER AT WORK NEAR ATLANTA, GA.

or convict labor. Under this system of road improvement, there has been constructed in Georgia within the last ten years, nearly 2,000 miles of graded road, about one-third of which has been surfaced with gravel or broken stone. The total amount of money now annually raised by the several counties of the state for road purposes aggregates in the neighborhood of \$400,000. A limited amount of this money at present is expended in the purchase of road machinery, tools, etc., but the greater part is used in actual road improvement.

#### METHODS EMPLOYED

The usual method adopted in this system of road working is as follows: Convicts, or free laborers, are organized into squads consisting of fifteen to forty-five men, which are placed under a competent superintendent and one or more overseers. Each squad is furnished with a camping outfit, two or more road machines, scrapers, wagons, from ten to twenty mules, plows, etc. The work usually commences on the leading roads radiating from the county seat, and consists, first, in going over the roads with machines, giving them the proper crowns, opening up the side ditches, macadamizing the boggy places, and occasionally cutting down the grades of the steeper hills. The main highways being thus worked over, attention is directed to the less important roads until all the roads in the country have been crowned and properly drained. The first working usually requires from one to three years, depending upon the condition of the road, and the number of hands employed. The second time the roads are gone over, more attention is paid to grading and considerable macadamizing is frequently done, and the work in general is of a more permanent and lasting nature.

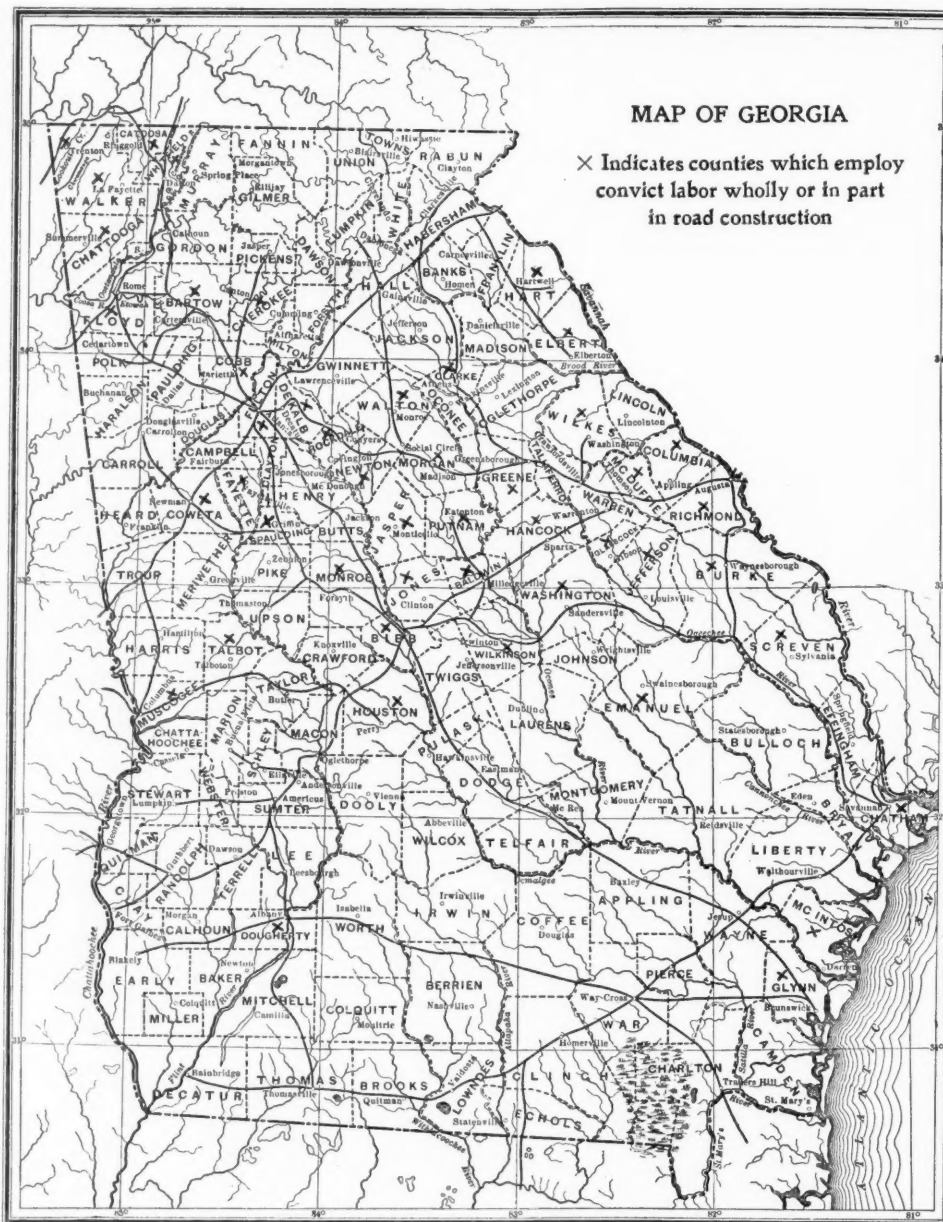
It is the intention of the road managers adopting this plan to keep up the process of gradual improvement until all the principal thoroughfares, at least in their respective counties, are properly graded, macadamized, and otherwise put in first-class condition. In those counties having large cities such as Fulton, Chatham, Richmond, Bibb and Floyd, where a large number of convicts are employed, the roads are frequently graded and macadamized at the first working, and afterwards kept in repair by a small force of hands detailed for that purpose.

#### THE SYSTEM USED IN ONE COUNTY

In order to explain more fully this system of road improvement, I will here give in detail the present method of road working in Fulton county. The system of improving the highways of Fulton county by means of convict labor, was inaugurated more than twenty years ago. At that time all of the leading thoroughfares radiating from the city of Atlanta, the county seat of Fulton, were in a deplorable condition for traffic during the early spring and winter months. To improve this condition, the county ordinary organized the first chain-gang of fifteen convicts and put it to work on the main roads leading from the city of Atlanta. This small and inadequate force was unable to do much at first except to carry on general repair work and keep the roads in passable condition. Nevertheless, the experiment demonstrated the practicability of this method of road improvement. The system thus inaugurated grew in favor and was gradually developed into the present very complete and perfect method of highway improvement. The Fulton chain-gang, as now organized, consists of about 350 convicts. These convicts are under the direct management of a superintendent appointed by the county commissioners. The superintendent, who receives a salary of \$2,000 a year, appoints

all the overseers, guards, etc., and is held solely responsible by the commissioners for the condition of the convicts under his charge, and also for the efficiency of the work executed. The amount of money annually appropriated by the county commissioners to enable the superintendent to carry on his work depends, in a great measure, upon the cost of road-surfacing materials. In 1899, the total sum paid out for all purposes, including the purchase of stone, etc., aggregated about \$90,000. This estimate would probably be somewhat over the general average of money annually expended on the public roads of the county in the last few years.

In working the roads, the chain-gang is usually divided into two or more camps which are moved from place to place as the work re-



quires. In addition to these movable camps, there is a permanent camp, or what is called the county barracks, located on the convict farm, where the convicts are housed during the winter. These barracks are well constructed and have all the conveniences of a well regulated prison.

In addition to the chain-gang, Fulton county employs also statute labor on its highways. All persons subject to road duty are required to work the roads five days each year, or pay a commutation tax of \$2.50. Many of the less important roads in the remote part of the county are kept up entirely by statute labor.

#### THE DIFFERENT KINDS OF ROADS BUILT

All the hardened ways so far constructed by the Fulton county chain-gang may be divided for convenience of description into three





MACADAM ROAD IN DE KALB COUNTY—COST \$2,000 PER MILE

classes, viz., the macadamized road, the chert road, and the rubble-stone road.

The macadamized roads, as they are now being constructed by the convicts, consist of four layers. The first, or bottom layer, which has an average thickness of four or five inches, is made of broken stone, having a diameter in their greatest dimension of about 4 inches. These stones usually consist of field-stone, or some other inferior rock, taken from the road-bed in grading. As this stone is removed from the excavation in grading, it is generally distributed along the prepared road-bed and broken by hand to the desired size. The stones of the second layer are reduced to  $2\frac{1}{2}$  inches in diameter. This layer has a thickness of about 3 inches when compressed by the roller. The stone used in this layer is generally more durable than that used in the basement layer and is commonly prepared by the rock-crusher. The third layer has about the same thickness as the second, but the stones of which it is formed are reduced to about  $1\frac{1}{2}$  inches or less in their greatest diameter. This layer is thoroughly compacted by passing over it a number of times a ten-ton roller, after which the fourth, and last layer, consisting of screenings, is added. This in turn is sprinkled and rolled until it becomes hard and smooth. A hardened way, when thus constructed of good material, makes an excellent road-way, which, under proper care, should last for several years.

The chert roads are surfaced entirely with chert. This material is generally put down in two or more layers and is thoroughly compacted by rolling until its total thickness is reduced to 8 or 10 inches. In some instances the chert roads have a foundation of granite, gneiss, or other stone, obtained from the roadway in grading. These roads, as well as the macadamized roads, are all amply wide, varying from 40 to 60 feet, and having gentle grades. The side drains, in most cases, are paved with stone, and the culverts and cross-drains, or water-ways, are constructed of granite or the best hard-burnt tile. The greater part of the material with which the chert road is constructed, is brought from the northwest part of Georgia, or Alabama, and in some instances it has to be hauled considerable

distances in wagons and carts before it is laid down on the road-way. This adds greatly to the cost of the chert and makes this class of roads very expensive.

The rubble-stone road, as constructed by the Fulton county chain-gang, consists of a pavement of broken stone similar to the rubble foundation of the Telford road. The surface of this class of roadways is always rough and uneven, yet it is quite durable. Where these paved ways have been constructed in Fulton county, the broken stone generally covers only one-half of the roadway, the remaining part being a well crowned earth road, which is almost universally used in dry weather.

#### MACADAM ROADS THE FAVORITE

The macadamized road as described above is the only class of roadways now being constructed in Fulton county. They are less dusty by far and are more durable than the chert road, and at the same time are smoother and more suitable for all kinds of travel than the rubble-stone road.

In Richmond county, where the same system of road improvement is adopted as above given, the hardened ways are constructed entirely of gravel. This material consists of water-worn quartz pebbles cemented together with iron-oxide and sandy clays. The cost of constructing these roads, which are usually about 20 feet wide, is about \$1,600 per mile. The roads of Floyd county, which county boasts of the greatest number of miles of improved roads of any county in the state, are also constructed by convict labor. All the roads of this county radiating from Rome, the county seat, have



MANCHESTER CHERT ROAD NEAR ATLANTA, GA.—COST \$10,000 PER MILE

been improved. They are surfaced with lime stone, or chert, and are kept in good condition at a comparatively small cost.

Excellent improved highways are also found in Chatham, Bibb and Muscogee counties, all of which work convicts on the public roads. The people in the several counties of the state where roads have been improved under the present system of road-working, are thoroughly in sympathy with the good road movement and frequently refer with pride to the excellent condition and constant improvement of their highways.

### AN EFFICIENT BOARD OF WORKS

THE report of the board of works of Vancouver, B. C., shows what can be done in a city with only limited means at its disposal. In taking up the work in detail it states that the bituminous rock pavement, while requiring few repairs during the past year, wore out rapidly in wet weather. The wood pavements were in good condition but in some cases had been covered with tar, asphalt and broken stone screenings. The board recommends that all the other wood pavements be similarly treated. The city pays one-third of the cost of laying cement sidewalks and a large number of these were laid in the past year at a total cost of fifteen cents per square foot. Bicycle paths are laid in different portions of the city as the needs indicated, \$2,400 having been spent in this work. Under a frontage by-law the streets were sprinkled, the rate being two cents per foot.

Only a few sewers were put in during the year, but the septic tanks, which have been in operation but a little over a year, have worked very satisfactorily. There is no complaint from any smell from the tanks, the effluent is clear and odorless and the sight is not objectionable, only the manholes showing. The forty miles of sewers in the city and the septic tanks require the care of but two men.

The expenditures of the board amounted to \$108,312.14, exceeding the appropriation by \$1,532.14. \$4,786.54 were spent on street cleaning, \$89,682.60 on street repairs and improvements, \$2,498.97 on sewers, \$380 on sprinkling and \$3,800 for a road roller. The city bought 11,995.50 cubic yards of crushed stone, for which it paid \$21,471.70. The work of the chain gang was carried on with good judgment, the value of the work done amounting to \$3,472.

## AMONG THE IMPROVEMENT CLUBS

A Gift to Colorado Springs—School Gardens as Improvement Centers—Boston Lectures—Denver Women—A Meeting at New Orleans—20th Century Club Bulletin—Baltimore Municipal Art Society

By Charles Mulford Robinson

### A GIFT TO COLORADO SPRINGS

THE Horticultural Society of El Paso County, Colorado, has been having a very interesting and joyful, not to say exciting, meeting. It is the opinion of persons in Colorado Springs, where the meeting was held, that it was the most important one in the history of the organization; but they had reason to be prejudiced. The meeting was the annual one and was largely attended by members of the organization and by others who are interested in city improvement. Reports of the year's work were read and were most interesting, and then there was submitted a communication from Gen. W. J. Palmer.

General Palmer stated that he and the other owners of a certain tract of nine lots on the north side of the Bijou street viaduct, now valued at \$22,500, proposed to donate the area to the society, for the establishment of a Horticultural Garden, to be as free to the public as is the Antlers Park on the south of it and as the contemplated park in the valley north of it will be. In fact, he said, it was the desire of the donors that the Garden should be a sort of park connection, and thus, as a distinct city improvement, should be something more than merely a society possession. The conditions were only that the land be fenced, graded, and parked in the present spring, and that the society build during the year 1902 "an attractive conservatory with library and meeting room," and agree permanently to maintain the ground and attachments in a satisfactory manner. And the making of these conditions was little more than a matter of form, for several public spirited men, led by Mr. E. W. Giddings, had already expressed to the society their readiness, should suitable land be secured for a park and garden, to give the money that would be necessary to improve it and erect the needed buildings. It is easy to understand, therefore, that the meeting was a joyous one and that persons in Colorado Springs consider it to have been very important. In a letter to the MUNICIPAL JOURNAL AND ENGINEER, Mr. Harry C. Harris, who is president of the society, gives a further evidence of the public's appreciation of the civic importance of the gift in the statement that the City Council has just granted \$250 to the society, for the survey of the grounds and the preparation of plans for the improvement. He adds: "This fact should be an encouragement to similar associations." It ought to be said, however, that the El Paso County Horticultural Society, like the big Minnesota State society—of which there was an account here in January—has not limited itself to horticultural work; but has wisely, and with much pertinence, shown its strong interest in all city improvement effort. Hence the gift.

### SCHOOL GARDENS AS IMPROVEMENT CENTERS

Reference was made in this department, in a recent issue, to the model school garden which—through the generosity of Senator James H. Stout, of Menomonie, and the genius of Mr. Warren H. Manning, of Boston—surrounds the High and Manual Training Schools at Menomonie, Wisconsin. A letter to this department points out the important and interesting fact that this garden is made a center for town improvement work, and one whose influence is reaching far. It was distinctly designed, our informant says, "to serve as a place of reference for all persons in the community who are interested in the improvement of their home grounds. The plants are labeled and Mr. Charles H. Ramsdell, who is in charge of the work, is ever ready to give advice and assistance, while from time to time Mr. Manning visits the town and counsels with those who evince a purpose to undertake seriously the work of improvement." In order to call attention to this function of the garden, the school issued a circular which, signed by Mr. Stout, announced that it should be the common desire to make the town attractive, and then said: "With this in view it is proposed that each lot owner prepare first a simple survey of his place (cross-section paper and directions were enclosed) and then

trace on the accompanying tracing paper a plan for the rearrangement of his grounds and plantations." It was promised that Mr. Ramsdell would give advice and assistance in the preparation of the surveys and plans, and that when completed Mr. Manning would examine them all, and the grounds, and make suggestions. "These suggestions," the circular added, "will usually require only a slight amount of labor, and, if the owner so elect, an expense of 25 cents to \$5 for plants and seeds. In making the suggestions, Mr. Manning will have in mind the effect of such improvements on the appearance of the town as a whole as well as on the appearance and convenience of each place."

It has seemed well, though the circular is not new, clearly to outline its character, for it is exceedingly suggestive. Here is a function which the school garden of any small town, or the school garden of any neighborhood, might well perform. The garden should be, not an incentive alone, but to some extent an example, and to large extent a source of practical hints and assistance, to the individual lot owners who wish to improve their grounds. Thus properly and beneficently may the school garden's educational influence be extended, and mightily in the effort for town improvement. In these spring days when the gardens are being prepared, let us keep in mind this possibility.

### BOSTON LIBRARY LECTURES

The trustees of the Boston Public Library, in pursuance of their plan of calling the public's attention to municipal problems by means of lectures by experts "on the various subjects interesting to the community," have arranged a course of lectures this spring on the "Aesthetic Development of Cities." The lectures, which began March 10th, will continue on Monday evenings until May 5th. The real practical value of the course is indicated by the fact that only two of the lectures—and they, very properly, the first and the last—are on subjects that may be called at all general. The special phases treated by the others are as follows: "City Streets and Squares," C. Howard Walker; "Small Houses and Grounds About Them," R. Clipston Sturgis; "Public Advertising," John DeWitt Warner; "Bridges," Edmund M. Wheelwright; "The Proper Function of Open Air Statuary," F. W. Ruckstuhl; "The City of Washington: Its Plan and Its Possibilities," F. L. Olmstead, Jr.; and "Water Parks," John Woodbury. The arranging of this course of lectures by the Boston Public Library is significant of the widespread, growing interest in this subject.

### DENVER WOMAN'S CLUB

The "Eighth Annual Announcement" of the Woman's Club of Denver comes in the form of an elaborate year book containing 150 pages, attractively bound in stiff covers of pale blue. The club is one of the strongest and most active in the United States, and the book, elaborate as it is, contains room for little more in the way of history than the lists of members, departments and committees, and the brief record of the many committee and department meetings. I had the curiosity to run through this record by way of counting the meetings. With little doing in June, and with July, August and September practically months of vacation, there are recorded in the list 252 such meetings.

To one of the departments of the club there has been given the distinct name of The City Improvement Society. The "Retrospect" says of it that it "has been, as usual, an active and practical force in all that makes for a more beautiful and wholesome city." With the task of providing school room decoration—a phase of city improvement effort though it be—another section of the club is concerned; and so well is it doing its work that the claim is advanced that Denver now ranks second, relative to population, among American cities in this regard. The City Improvement Society has its own complete list of officers, and meetings were held on the first Wednes-



day morning of each month. In all matters of public service, however, the influence of such an organized force as this club, is found to be even more far reaching than on its numerous specific activities.

#### A ROUSING MEETING AT NEW ORLEANS

The Progressive Union of New Orleans, an organization of many hundred enterprising business men who are united for the progress of New Orleans, has been holding a series of very successful monthly meetings. At these, in addition to the transaction of regular business, an address is made by some interesting speaker. Through the kindness of one of the members an account has been sent to the MUNICIPAL JOURNAL AND ENGINEER of the mid-February meeting. This account fills a whole page of the New Orleans "Picayune," and is therein described as "the greatest meeting" the Union has ever known; as attended by the largest crowd, and as having "more enthusiasm to the square inch than any preceding meeting had known to the square yard," and that does not mean that its predecessors have lacked enthusiasm. The principal speaker was President Edwin A. Alderman, of Tulane University. In the course of his address he said:

In America we have built 400 cities since the year 1800. We are building more. The trend toward urban life is not to be denied. It has caused the birth of the Science of City Building and City Development. You who belong to the Progressive Union are studying the Science and there is none higher. The Greek worshipped his city. In the American world the city is an arena where free men meet to lift themselves up, and the city with them. American cities, have, most of them, like Topsy, "just grewed." They pass through infancy, childhood, youth and maturity. In infancy anything is counted as growth from a water tank to a barroom. In childhood the city becomes ambitious. In youth a definite aim appears, and with maturity should come the time of rounding out and beautifying. I believe that New Orleans has reached the age of maturity.

Dr. Alderman advocated in his address the establishment of a state board of architectural examiners, and the making of some effort by the Union to secure more uniformity, or at least harmony, in the buildings of the city. The "Picayune" account declares that no meeting ever held in New Orleans has been "so pregnant of civic enthusiasm."

#### CONVENTION PLANS

Arrangements for the summer meeting of the American Park and Outdoor Art Association are already well under way. The dates of August 5th, 6th, and 7th have been fixed upon, but for several days after the convention closes excursions will be planned and competent guides provided, in order that visitors may have the opportunity of going to the places of interest in and about Boston without missing convention sessions. One special day is to be devoted to a meeting of park commissioners and others interested in park work. An effort is being made to have all cities, especially those of over 50,000 population, represented at this session. Another session will be in charge of the Women's Auxiliary. Among those by whom papers or addresses have already been promised are: President Eliot of Harvard, Clinton Rogers Woodruff of Philadelphia, Mira Lloyd Dock of Harrisburg, Dr. Albert Shaw and Charles Mulford Robinson. There will, further, be a full and instructive discussion at all sessions. The convention is to be held, a bulletin announces, "under the auspices of all the leading societies in Boston whose work is along similar lines to that of the Outdoor Art Association."

#### TWENTIETH CENTURY CLUB BULLETIN

The January *Bulletin* of the Twentieth Century Club of Boston contains the report of the Club Council for the last year. The membership of the Club is given as 454, a net increase for the year of 35. Of the members 295 are men, 159 are women, and 21 of the full number are non-residents. During the year there were lectures or addresses by eighty-five different speakers, most of them persons of state or national reputation and some of them of international. Their themes covered a wide range. Among the topics of civic interest were Municipal control of the proposed Washington street sub-way, the Metropolitan Park system, the improvement of the Charles River basin, the abatement of the smoke nuisance, the regulation of the price of gas, cleaner streets, the improvement of the Boston School Committee, the Mills Hotels in New York, and the progress of municipal government in Great Britain. The division of

the Club into departments was discontinued during the year and there was substituted a simpler arrangement of work through standing and special committees, with more frequent conferences upon special topics. The cause of the change was the unwillingness of many of the Club members to be enrolled in any single department and attend its separate meetings. The establishment of the monthly Club *Bulletin* is also a new feature. The Council has established a lecture bureau with forty-eight lecturers drawn from the Club membership. A commission of one dollar is paid to the Club for each engagement, and already inquiries have come from fifty different places. The special function of the Club, as viewed by the Council, is to offer "a helpful center for those who are actively engaged in definite movements of philanthropy and reform rather than to enter itself directly upon such movements."

#### BALTIMORE MUNICIPAL ART SOCIETY

A Baltimore reader has sent to the MUNICIPAL JOURNAL AND ENGINEER the address made by Mr. Theodore Marburg at the recent annual meeting of the Baltimore Municipal Art Society. It is an excellent survey of the work which the Society has done in its three years' existence and sketches the large hopes and plans for the future. Mr. Marburg described the activities of the Society as having been thus far directed mainly toward the accomplishment of four objects, viz.:

1. To cultivate the taste and add to the happiness of the children in the public schools by beautifying the school-room.
2. To provide the best examples of the sculptor's and painter's art in public spaces and in public buildings, perpetuating in so doing the memory of illustrious deeds and characters.
3. To point out wherein Baltimore is behind other communities in provision for the public needs.
4. To emphasize the importance of foresight in the development of the future city.

In regard to the first object, five schools have been wholly or partly decorated through the efforts of the Society. In the second field of its activity, while not yet able to show any completed work, it has much of importance under way. This includes decorative mural paintings by Blashfield and Turner for the fine courthouse and a statue of Howard by Fremiet. In the courthouse, remarked Mr. Marburg, there is ample field for activity for many years to come. The structure is so good and will lend itself so admirably to ornamentation that the work should be followed up. The Society's third object involves some prosier lines of action which, most commendably, it has not been willing to ignore. These include an effort to abate the smoke nuisance, an attempt to limit by law the height of buildings around the Washington monument, and the wise settlement of the pressing sewage question. As to the proposed building regulation, civic pride is appealed to by the claim that the monument is the third most beautiful column in the world, ranking after Trajan's and the Column of July. The effort is to prevent its dwarfing by the construction of tall apartment houses close around it. The specific end in view under the fourth general head is the acquisition by the city of a belt of land completely surrounding the present municipality. Two objects are sought by this daringly comprehensive plan: "First, the preservation of fine bits of parking; and second, the important revenue the city would derive from the land when built upon, the plan involving not the sale of the land but its lease for a term of years." It is further pointed out that the sum expended in correcting those bad conditions within a city, that results from its permission of haphazard growth, would yield immense results if applied to the acquisition and control of that suburban land which is destined to become the city of the future. Mr. Marburg advocated the employment of a landscape architect, who should be also an engineer, to make a report on the park opportunities of the area. He urged further, as another field of action which, he said, the Society hopes ultimately to enter, the aiding of art industry in Baltimore. A first step, he thought, would be "the establishment of a museum that would offer models, impart knowledge, and cultivate the taste of the workman." Then would come prizes for good designs and financial aid to promising young craftsmen. It thus appears that the Municipal Art Society of Baltimore is very much alive to its broad field, its large obligations and its splendid possibilities.

## WATER, WATER SUPPLIES, AND EPIDEMICS OF DISEASE

One of the Vital Problems of the Hour—Some Pertinent Suggestions on the Water Supplies for Towns and Cities—  
The Most Noted Bacteriologist of the Empire State

By William C. Bissell\*

ONE of the greatest problems which, at the present time, confronts municipalities is the providing of an abundant and adequate supply of a pure and wholesome water. The value of such a supply in its relation to the health and prosperity of a community has long been recognized and without such measure fairly well regulated no section can be prosperous either from a healthful or commercial standpoint.

Modern study and investigation have demonstrated without question of dispute the intimate relationship existing between drinking water and certain forms of disease. When one considers that water is the main constituent of the human body and the principal element in all animal and vegetable life, it is easy to understand how important it must be that this chief supporting factor should be free from any harmful material, so that when entering into combination it will not produce a deterioration in the final composition.

### VARIED ANIMAL AND PLANT LIFE

All forms of animal and plant life will not survive if the water used in their propagation contains matter that impairs the health or engenders disease.

Appreciating this fact it is not surprising that the human economy will not tolerate the ingestion of real impurities in water. The extreme sensitiveness of the human system can be noted when one recalls the unpleasant results that so frequently occur when traveling and using the water of different localities, which in themselves do not contain bacterial impurities, but differ only in chemical composition, as relating to the degrees of "hardness and softness."

The two main diseases transmitted through the use of water, and therefore termed "water-born diseases," are cholera and typhoid fever.

In addition to these conditions there are other ailments which are not in themselves of a specific character, which may arise from the drinking of impure water. The continual use of a moderately polluted stream can result in the impairment of health and the lowering of vitality, precisely similar to that resulting in the continual breathing of foul air.

It would be tiresome to enumerate and describe the epidemics that have occurred through the use of impure water, but there is one fact that is astonishing and does seem to require emphasis, *i. e.*, when such epidemics occur and have subsided the public, as a rule, does not appear to appreciate the lesson it teaches, for how often epidemics of typhoid will follow one another, with little apparent effort on the part of the community to remedy the evil.

I have in mind at the present time the city of Niagara Falls, where more typhoid fever occurs than in any other city of its size in New York State. They have drunk the sewage of Buffalo for years, yet little active effort is being made to eliminate the evil.

### CARE IN SELECTING SOURCE OF WATER SUPPLY

In deciding upon and investigating a source for a public water supply, both practical and scientific measures should be employed and carefully considered. From practical, I mean the question of economics, *i. e.*, the price to the consumer should be considered. It may be argued that a municipality should have a pure water supply at any price, which is true, but it must be remembered that pure water can be obtained under differing conditions, greatly affecting the price; *e. g.*, Buffalo pumps its supply from Niagara River. It is practically the water of Lake Erie that is supplied to the consumer. The water of Lake Erie is not unpolluted by any means, and the city of Buffalo unquestionably obtains a considerable amount of its typhoid fever from the direct use of the water supplied to the householders. Such water can be made absolutely safe by means of individual household purification, and if each household would observe this measure the amount of typhoid fever occurring in the city of

Buffalo would be limited to that imported from other localities. This method is at the present time the most practical means of purifying Buffalo's supply, because it is less burdensome to the persons subjected to taxation.

Of scientific measures, the engineering, chemical and biological examinations are essential. The competent sanitary and hydraulic engineer can determine the means by which a supply can be brought to and distributed through a municipality. The water analyst can determine the exact quality of the water distributed. In determining the quality of water both chemical and biological investigations should be carried on, the one supplementing the other.

From the strictly sanitary standpoint the biological examination will be of the greater service, for it makes little difference, as regards the dissemination of disease, in the composition of waters, providing the elements of sewage are not contained therein. Such elements are best detected by bacterial means of investigation.

The different sources from which a municipality might derive a supply are as follows: (1) Rainfall direct; (2) Ground-water; (3) Surface-water; (4) Deep-seated water.

The rainfall as collected from roofs and stored in cisterns is but little used in this part of the country even as a private source of supply. Good water can be obtained by this means, but in a municipality impure water is more often met with than one that is satisfactory.

The purity of rain water depends upon several factors:

- (1) The conditions of the atmosphere through which it falls;
- (2) The character of the roof over which it flows;
- (3) The kind and condition of the cistern in which it is stored.

In country districts, on account of the freedom of the air from impurities, the quality of rain water is usually good, but in cities water so collected is sure to contain objectionable qualities.

Clean metal or slate roofing does not injure the quality of rain water, but wooden shingles, foul with dust and decaying vegetable matter, will cause the water to become "musty" a short time after its collection.

### STORAGE AND GROUND SUPPLIES

The condition of the storing receptacle greatly affects the quality of a water. A cistern should be constructed of masonry and should be well ventilated. It should be frequently cleaned and should never be located in a dark and inaccessible corner under a building. The frequently adopted filtering appliance, of building a brick wall partition through which the water percolates, is to be condemned, for such appliances are filters in name only and are of a greater evil than benefit, as they cannot be cleansed.

Ground water is in many respects the best source of supply that can be obtained. Such water is more or less purified as it filters through the soil and by the layers of soil lying above, it is protected, to some extent, from surface pollution. While this is the rule, there are many exceptions. In the country districts, which are not thickly populated, this source of supply is the most desirable, but in municipalities ground water can seldom be relied upon for purity unless it is taken from a higher elevation and at a considerable distance from the city it is to supply. Among the methods by which ground water may be obtained are: (1) Springs; (2) Dug wells; (3) Driven wells; (4) Infiltration galleries; (5) Large open wells.

Spring water is usually very desirable, providing the watershed is in an unpopulated district. When a spring is to be considered for a public supply, it should be submitted to careful scientific investigation and if the water is found to be adequate in quantity and wholesome in quality, the outlet and collecting basin should be thoroughly cleaned and effectually protected by masonry. Such procedure has been successfully carried out in many small municipalities.

Of the dug wells, the one usually found in the individual farmer's yard is a good example. Such means of obtaining a water supply

\* Bacteriologist of Buffalo Health Department.



has been in existence from time immemorial. The quality of the water secured by this method varies greatly, depending largely on the formation of the soil in which the water lies or through which it has passed. Water absorbs more or less of the soluble matter found in different kinds of earth strata, and in regions containing limestone the water will be very "hard," due to the presence of carbonate of lime, while that passing through saline, sulphur or iron formations, will contain differing amounts of the materials mentioned.

The chief difficulty that arises in the use of dug wells as a source of ground water supply, is that, while the water may be naturally of good quality, it is liable to pollution in many ways.

In country districts, a well located apart from all buildings and barn yards may retain its usual character, but a well situated close to, or under, inhabited dwellings is very liable to contamination, and the greater the number of inhabitants the greater is this danger.

#### DANGER IN PRIVATE SUPPLIES

When a public water supply, of any known degree of purity, has been introduced into a city, all wells should be abandoned. It is frequently very difficult to convince the members of a household that their well is polluted. The argument universally used is that the members of the household have used the water for twenty years or more without the slightest harm, which in their opinion must prove that the water is safe at the present period. A short time ago the authorities of Chautauqua Assembly passed through such an experience, and in their efforts to close wells that were found to be polluted, they involved themselves in expensive litigation.

Driven wells are those bored to a considerable depth, and usually extend through a strata of rock. They have the advantage of economy and simplicity in construction and operation. Such water supply is, however, open to the same dangers as are dug wells and are rarely to be considered serviceable for city use.

Infiltration galleries are widely used in certain sections of the country and particularly in Vermont. It consists in sinking a horizontal wall in a sandy or gravel soil formation alongside or in the near vicinity of a stream. The water so secured has the usual characteristics of ground water. It is most prone to the growth of vegetable formations which invariably impart a peculiar taste, and although it is in a degree filtered water, such filtering appliances readily become foul and fail to produce a safe supply.

Too much reliance should not be placed on the filtering qualities of infiltration galleries, as no form of a filter can long continue to be effective that does not permit of cleansing. In a personal investigation of the water supply of Brantford, Ontario, which has an infiltration system, the writer found that 80 per cent. of the bacterial flora passed through the filtering gallery. Artesian wells, occasionally used as a source of water supply, generally reach a very deep seated water. There seems to be a popular opinion that water so obtained is invariably of good quality. Facts, however, do not support this view, for waters so obtained are most apt to be charged with mineral constituents that render them objectionable for domestic use, although they may not contain organic impurities.

Large open wells are merely exaggerated forms of dug wells, being perhaps forty feet instead of four feet in diameter. They are open to the same objections as are dug wells, but have the advantage that two or three suitably located, may be used as a public supply to an entire municipality.

#### SURFACE WATER SUPPLIES

The large cities of the country most frequently depend on surface waters for their supply. Such water is obtained either (1) from small streams, (2) rivers, or (3) lakes.

Water so obtained is usually of a soft character and especially well suited for general commercial and domestic use, but at the present time it is more prone to pollution than any other source of supply. The general introduction of water-flushing sewer systems throughout the world has resulted in a universal contamination of most natural water-ways. Many surface waters which were formerly adequate and pure supplies for cities using them, have forced municipalities either to seek means of purification, by the expensive construction and maintenance of filter beds and household methods, or use the polluted water and reap its evil results. Illustrations might be enumerated by the hundreds, but the

fact is so well known that it does not seem to require much comment. By the use of streams and rivers into which sewage flows, the results are generally more serious than by the use of a lake water.

The old idea that running water purifies itself to any extent is erroneous and personal observations along this line confirm the results obtained by many other investigators, that mechanical agitation and aeration plays little or no part in the purification of water. Water going over Niagara Falls is of the same character as regards pollution, as that in the river just above.

In the use of lake waters, the factor that lessens the danger is that the organic sewage pollution, if the lake is large enough, is given an opportunity to settle and become deposited on the bottom and there undergo slow oxidizing changes which renders inert much of the contamination.

The public water supply of Buffalo is a good example of this condition. When the water of Lake Erie is not disturbed, the sewage that is emptied into it by the cities of Erie, Cleveland, etc., settles, to a large degree, before it reaches Buffalo.

During high winds and storms, Lake Erie being comparatively shallow, has its bottom disturbed, and the dirt deposit so frequently found in the bath tub, during certain seasons of the year, is due to this cause. If the reports of the Health Department are consulted, fourteen days following such occurrences, it will be observed that the typhoid rate invariably increases, which demonstrates that the water supply from Lake Erie is directly responsible for some of Buffalo's typhoid.

#### PURIFICATION OF WATER SUPPLY

Whenever it is necessary to depend upon a polluted source of supply resort should be had to some means of purification.

In no branch of sanitary science has more progress been made than in that relating to the purification of water. While there is still much to be learned in regard to this matter, our knowledge of the subject has reached such a stage that no city need hesitate to introduce means of purification for fear of failure to accomplish the desired result.

The means of water purification which are in more or less common use are three in number, namely (1) sterilization, (2) sedimentation, (3) filtration.

The common method of household sterilizing by boiling is familiar to almost every one. This method furnishes an absolutely safe water at a slight cost. It is a method necessarily limited to private use, for the wholesale treating and distribution by municipalities would not be feasible.

In treating waters which carry a large amount of matter in suspension, as is the case of several western rivers which do not contain sewage, sedimentation is the best means of purifying. Such water, although muddy in appearance from the sediment it contains, will clear, and to a greater degree, purify itself by being brought to a state of rest, or by flowing at a low velocity, through suitably constructed reservoirs. If the objectionable features consist of finely divided particles of the soil through which the water has passed, sedimentation is all that is required.

The process of filtration is in all respects the most important, particularly as regards efficiency. The types of filters used are of three kinds: (1) The domestic filter that is applied to the household tap; (2) mechanical filters—to filter water on a large scale; (3) filter beds for use in public supplies.

Of domestic filters there is but one type that is efficient. Sand, charcoal and gravel, even in combination, will not, on a small scale, retard the passage of bacteria. By the use of unglazed porcelain the majority of bacteria can be retarded for a greater or less period of time.

Mechanical filters are usually made of some coarse meshed material and a coagulant used, like alum, to precipitate the organic matter.

Filter beds are constructed on a large scale, with the use of gravel and sand. They are efficient if properly maintained and many of the European cities of to-day owe their small death rate from typhoid fever to this means of water purification.

In conclusion allow me to state that just so long as American cities pour their sewage into waterways and drink the water unpurified, just so long will epidemics occur of water-born diseases.



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### INFLUENCE OF EXPOSITIONS ON OUT-DOOR ARTS

OSTENSIBLY World's Fairs are promoted to enable all countries and states to display to many people their natural advantages and resources in such a manner that colonists and capitalists will be induced to develop them; to enable manufacturers and other producers to extend trade by displaying their products; to display works of art and the results of sociological, philanthropic, and religious efforts; and to bring together in conference the representatives of all such activities for an exchange of ideas and mutual acquaintance.

Really World's Fairs are promoted to "boom" a city and to induce our national and other governments to put money into the coffers of local merchants. Local subscriptions are invariably solicited on the ground that the fair will draw a certain number of visitors, each one of which will leave a specified sum of money of which each local contributor must surely gain some part.

Each exposition is followed by a local contention as to whether the city was or was not benefited on the whole by the undertaking. Presumably the division of opinion lies between those who did and those who did not receive what they regarded as a fair share of the governmental and individual contributions to the city's welfare, with a sprinkling on the one side of those of the real workers to whom the honors they received were not enough to offset their labors, and on the other side of those whose vanities were pleasantly tickled. In any event it is safe to say that no city once having gone through the throes of a World's Fair will attempt another in this generation, even if it were possible to again induce a paternal government to lay a few million dollar eggs in the exposition nest.

It is, of course, difficult to trace the direct results of an exposition. A city probably receives directly from the exposition more money than it actually expends, but indirectly the loss is probably much greater than the gain. Many of the "boomers" of the fair have little to lose and much to gain. The substantial and far-seeing citizens are compelled to contribute time and money from a feeling of loyalty to their city. They know that without such contributions the fair would be a failure. Many of them know, too, that the same amount of money and energy expended upon the improvement of the city, the improvement of the condition of the people, and the development of its industries and resources would result in an infinite greater permanent gain. They know that much local capital will in view of the fair be tied up in undertakings from which no return can be hoped for for a long time after the fair closes, and, furthermore, that

the exposition will lead capitalists to invest money in other localities that otherwise would be invested at home.

This, of course, is the selfish point of view, but it is, I believe, the point of view that will result in defeating after the St. Louis exposition any further attempts at a great World's Fair for a long time, unless it may be at the National Capital directly under the auspices of the United States Government with periods of special interest and special transportation facilities and rates to draw citizens from all parts of our own and foreign countries. At Washington there is and always will be the best representation of the country's resources arranged in the most instructive manner. It is likely that there will continue to be local expositions in which local resources will be effectively displayed. If they could be in a sense outposts of a great permanent exposition at Washington which could establish traveling exhibits for their benefit they would be of far more permanent value than the theatrical outbursts of local pride represented by the quarter century exposition period that is passing by. However much or little cities may be advancing their own interests by holding expositions, I think there can be no question as to their value in promoting the welfare of the nation as a whole as long as they are given a distinct educational value and can draw large numbers of visitors to profit by the lessons they teach. If it were not so there would be no justification for national appropriations.

It is of course difficult to trace or measure with definiteness the results of a World's Fair. Every one of the millions of visitors to our great expositions must, however, have been quickened intellectually and morally by what they saw, if they kept away from the midways. Surely the Court of Honor at the Chicago Exposition was a dream of beauty that could not fail to lift all thoughts and aspirations to a higher plane. Many people needed such an incentive to draw them from their home and give them the broader outlook that travel alone can give.

One of the most important results of the exposition as far as it relates to the material and æsthetic welfare of our nation as a whole is the advancement of the outdoor arts as represented by Landscape Design, Architecture, Sculpture, the closely allied industries of floriculture and horticulture, etc., and the closer personal professional relations that have grown out of the design and execution of the plans for these World's Fairs.

The influence of the Chicago Exposition upon the men engaged in the outdoor arts was positive and direct. That it was a profound inspiration to architects to do better work was made evident almost immediately in a better class of business and residential buildings. It gave professional men and the people at large a conception of the profession of landscape architecture as a fine art, and its importance as a dominating factor in determining the fundamental plan of grounds and building location in an important scheme of this character that nothing else had done, for it was generally known that the site was adopted on Mr. Olmstead's advice, that he outlined the general plan in his report, and was one of the conferees that placed the first draft of the plan upon paper, and that all landscape work was under his direction. The sculptors and mural decorators also opened a broader field of usefulness by their work at Chicago. Since this fair the men and women of the allied fine art professions have been coming closer and closer together in their relations. They are seeking to co-operate with each other more frequently in public and private work. A natural outgrowth of this co-operation is the serious and practical consideration of comprehensive schemes for the promotion of civic beauty that will after a time make America the most beautiful country in the world. WARREN H. MANNING.

### AN ADMIRABLE CORPORATION INNOVATION

PRESIDENT VREELAND of the Metropolitan Street Railway Company of New York, has recently inaugurated an innovation which will ultimately be adopted in the leading cities through the United States, for it is one which will undoubtedly commend itself to the good judgment of the street railway managers. Beginning with July 1, 1902, the street railway system, of which Mr. Vreeland is the president, will establish a pension system for the superannuated employees of the concern. This will be the first pension system ever established for street railway employees in this country.



The avowed object of the Metropolitan Company in establishing this department is "to preserve the future welfare of aged and infirm employees and to recognize efficient and loyal service." The system provides for all employees of the company whose annual maximum wages have not exceeded \$1,200. It makes seventy years the age for compulsory retirement and provides for the pensioning of those between sixty-five and sixty-nine who may become physically disqualified for service. The pension allowance to retired employees shall be as follows: For thirty-five years or more of continuous service, 40 per cent. of the average annual wages for the ten previous years; for thirty years of continuous service, 30 per cent. on the same basis; and for twenty-five years of continuous service, 25 per cent. The fund from which these payments are to be made will be appropriated each year by the company, and employees will not be required to contribute to it. The Metropolitan system comprises more than twenty constituent street railways, and it employs about 15,000 men. The greater part of these will come under the provisions of the new pension plan, and through them President Vreeland computes that directly and indirectly the scheme will affect nearly 100,000 persons in the city of New York.

If in addition to this, the Metropolitan Street Railway Company will inaugurate what is known as the "dividend bearing wage," that is give to each employee, quarterly, the same dividend upon the aggregate amount of his wages for a given quarter that is paid to the stockholder; if it will give one suit of clothes a year to men who have been in service for five years and two suits of clothes to those who have been in the service ten years, it will accomplish something like an ideal condition and something commensurate with the amount of its earnings. It could well afford to do all these things. As a matter of fact it can better afford to do them than to leave them undone. Future events will bear evidence to the fact that it will be one of the effective means of preventing a strike. When it is taken into consideration that this company receives a straight five-cent fare, there is no good reason why it should not divide its immense earnings, to this extent, at least, with its faithful employees.

Up to the present time the Columbus Street Railway Company of Columbus, Ohio, carries off the palm for the best treatment of its employees, and its example should incite other public service corporations to the same treatment. For instance, it gives a Thanksgiving turkey to every one of its employees each year—single men being permitted to receive one dollar rather than a turkey if they so elect—men who have been in the service of the company for five years receive one suit of clothes a year, those who have been in the service ten or more years two suits of clothes. In addition to this, after a man has been in the service for three months or more, he receives the same dividend upon his quarterly wages that is paid to the stockholder. This company has never had a strike. Its employees are well satisfied with their treatment. It is a notable fact that, although the president of the National Street Railway Association of Employees was formerly employed by this company and is well known to the Columbus men, he has never been able to form a street railway labor union in that city. There has been no need of any. Practices like the above afford a good foundation for a rosy view of the future by the optimist. It is one of the encouraging signs of the times.

### THE BETTERMENT OF STREETS AND HIGHWAYS

In our February issue we called attention editorially to the new pavement known as Bituminous Macadam, which was extensively laid in several New England and Eastern cities last season. It has stood the winter so well and given such perfect satisfaction, that we are constrained to again refer to its excellent points for the sake of our readers, most of whom are keenly watching for the ideal pavement. Elsewhere in this number an engineer writes upon the subject, quoting extensively from the annual reports of city engineers and superintendents of streets in New England cities where the pavement was laid, and gives the opinion of private citizens and the daily press. When the judgment of men like Prof. A. W. Dow, Government Inspector of Pavements and Asphalt, of Washington, D. C., and that of many other eminent engineers is also taken into consideration, it

behooves the progressive mayors and other city officials who have not yet investigated this question to examine into the merits of this pavement.

Mr. Henry H. Lane, President of the village of Peekskill, N. Y., in his recent annual message, remarks: "The attention of the board is called to bituminous macadam waterproof pavement. It is a new pavement made of hard crushed stone cemented together with bituminous mortar and is being adopted in many cities. It combines the advantages of asphalt and macadam and overcomes most of the objections of each, such as: first, slipperiness and liability of the asphalt to crack and disintegrate; second, the mud, dust, rapid wear, washing out and unsanitary features of macadam. In addition, it gives a more solid and dense, and therefore, more waterproof and durable wearing surface, than either asphalt or macadam. It is claimed for this new pavement that it has several times more life than asphalt pavement, and that it is being laid at a less price than asphalt or brick in the New England States. Prof. A. W. Dow, Government Inspector of Pavements, of Washington, D. C., says of the pavement: 'It exceeds in good qualities any pavement I have ever seen laid.'"

Mr. Lane expresses another opinion which is worthy of wider publicity than will be given it in his annual message, when he refers to the need of the village owning its own road building plant: "I am firm in my opinion," he said, "that the village should own a complete road building plant, consisting of a stone crusher, screens and steam roller. The best results on our streets, whether we use stone or gravel, cannot be obtained without the use of a steam roller. Instead of buying stone I would advise that we crush stone during the winter months, thus giving employment to many of our villagers who work upon our streets during the road working season." It is fortunate for the good roads interests in this country that Mr. Lane is not alone in holding this opinion. There are scores of other progressive mayors and city officials who are earnestly interested in bettering our public streets and highways. The work that is being done by the National Good Roads Association, under the leadership of President W. H. Moore and Martin W. Dodge, Director of Public Road Inquiries, Washington, and that which is projected by the American Road Makers, a national organization, not to mention the scores of state, county and local associations banded together for the same purpose, leads one to take the most optimistic view of the possible results which will be achieved during the next decade, in the betterment of our streets and highways. If the pace already set can be maintained for the next half century, the United States will be able to boast of a larger mileage of perfect roads than all of Continental Europe, although it has had more than a thousand years the start of us.

### NEED OF REGULATIONS FOR FIRE-PROOFING

THE disastrous fires which have recently occurred in Waterbury, Connecticut; Paterson, New Jersey, and New York City, have added additional evidence in support of the imperative need of more rigid building regulations in American cities, particularly with respect to fire-proofing. There is such a need, also, for the rigid enforcement of existing regulations respecting the construction of all buildings within fire limits; and, furthermore, in the provision and enforcement of similar rules for the inspection of public buildings. Had there been adequate regulations in regard to the construction of fire-proof buildings within a certain limit strictly enforced in the cities of Waterbury and Paterson, the disastrous fires which occurred would have been impossible. The same is true in regard to the recent Park Avenue Hotel fire in New York. In the first place, had fire-proof regulations been enforced in the construction of the armory, from which the hotel took fire, the disaster would have been averted; second, if restrictive inspection rules had been rigidly enforced the Park Avenue Hotel would not have taken fire and the disaster would have been avoided. The officials have betrayed their trust and have been recreant in the discharge of their duty, and, as a consequence, many lives have been sacrificed as well as millions worth of property destroyed.

Herein we have something to learn from our neighbors across the

Atlantic. The officials of English and European cities are more faithful in the discharge of duties where human life is involved than are the same class of officials on this side. The people on the other side learned their lesson by experience five hundred years ago. It seems to be impossible for one city to profit by another city's experience, and it may be necessary in the course of human events, for us to learn by the same slow and expensive process, but it seems to us that these striking evidences of official delinquency should be sufficient to put us on our guard in the future, and forcible enough in their warning to make citizens in general demand of their officials a stricter account.

In commenting upon the fire question the *American Architect and Building News* makes some pertinent remarks upon another phase of the subject which we are pleased to quote:

"This has been the history of so many destructive conflagrations, particularly those in buildings intended to be fire-proof, that experts have long agreed that no structure in a closely-built city can be considered even approximately secure against fire, so long as it is provided only with ordinary windows. Shutters of iron, or of wood covered with tin, will protect windows if they are used; but, in practice, such shutters are out of the question for a hotel, and the only resource available in their place is the use of wired glass. That such glass, if set in metal sashes, and these in small frames, will keep out fire as effectually as ordinary shutters, has been many times demonstrated, and, if it were not for its unattractive appearance, and its disposition to crack over the wires, the wired glass would be used very extensively, on the advice of architects. The latter, however, are obliged to consult the wishes of their clients in regard to the appearance of their buildings, as well as in regard to its security from fire, and clients who are satisfied with a network of chicken fencing in their front windows, diversified with cracks, and bubbles, are rare. Nevertheless, the protection which it affords is so valuable that, if means could be found for making it even tolerably ornamental, its use would be greatly extended; and it does not seem impossible that such means might be found. Some of the glass set in small pieces in copper bars is extremely pretty, besides being nearly as fire-proof as the wired glass; and, if manufacturers were disposed to take up the matter, there are plenty of architects who could furnish designs for imbedding in the melted glass an ornamental pattern in wire. In this, or some similar way, using also metal-covered doors and metal trim, hotels could be made readily fire-proof; and it does not seem unreasonable to suggest that the next amendment to the building laws might well take the form of a prohibition of the use of wooden window frames or sashes, or of glass in pieces of more than nine square inches, in any outside or courtyard wall of any hotel. That there would be resistance to such an enactment from the proprietors of stores on the street floors of hotels, and, possibly, from hotel landlords and their guests, is certain; but the latter would soon become accustomed to the change, and would probably find æsthetic attraction, as well as consciousness of safety, in the subdivided glass, and the objections of the former should not be considered in comparison with the safety of the hotel guests whose lives are imperilled by every sheet of plate glass in the building to which they entrust themselves."

It is about time that city officials throughout the country were awakened to a full sense of their duty. The mayor, even though his authority may be limited, has an influence which he is in duty bound to exert in bringing about a right state of affairs in this connection. We appeal to the mayors of American cities to use the full power of their authority in an endeavor to bring about the solution of this problem which is of such vital importance. It can be done with a little thought in advance, and we see no reason why immediate steps should not be taken to remedy the evil.

### PROGRESS OF GOOD ROADS IN THE SOUTH

In this issue will be found a descriptive and illustrated article of the good roads system of Georgia. A careful reading of the article will show that the progress in this Southern state compares very favorably with similar work in the most progressive Northern states, but we are glad to note that the trip of the Good Roads Train has

aroused greater enthusiasm in the cause throughout the South than has ever been experienced before.

The work of this Good Roads Train will culminate at Charlottesville, Va., on April 2, 3 and 4, when the Jefferson Memorial Road Association will complete, as an object lesson, a stretch of road leading from Charlottesville to the tomb of Thomas Jefferson, at Monticello, a distance of about two and one-half miles. This climax to the good roads work in the South during the past winter is made possible through the combined efforts of Hon. Martin Dodge, Director of Public Road Inquiries, Washington, D. C., and Col. W. H. Moore, of Chicago, President of the National Good Roads Association and Director of the Good Roads Train.

The old road was a bridle path crossing Moore's Creek at a ford. The development of one hundred years has served to widen this bridle path so as to make a narrow roadway with a primitive wooden bridge at the ford; but the original location was so poorly selected that the road rises at the rate of sixteen feet in one hundred feet in many places, and is exceedingly dangerous to travel with wheeled vehicles, especially when the ground is slippery. No amount of improvement over such a steep course could make a desirable road. This was perfectly evident to Director Dodge and Col. Moore when their advice was solicited by Gen. Fitz-Hugh Lee, President of the Jefferson Memorial Association.

As a fitting close to the work in the South a Jefferson Memorial and Interstate Good Roads Convention has been called to meet at Charlottesville upon the days above mentioned to view the road, see the progress of the work and discuss the road question in all its various phases. On this occasion it is expected that a multitude of people will be assembled to be addressed by a number of distinguished men. Gen. Lee will preside and Governor A. J. Montague, of Virginia, will deliver the address of welcome. Secretary James Wilson of the Department of Agriculture, will be present and deliver an address. All those who desire to witness the work of modern good roads machinery will find it profitable to attend this meeting. We earnestly hope that it may be an unbounded success.

## EDITORIAL COMMENT

ACCORDING to press reports some of the merchants and business men of Youngstown, Ohio, seem to be strongly opposed to the use of litter boxes on the street for the receipt of fruit peels, waste paper and other refuse. We wonder why these citizens prefer to have the litter blowing about the streets than to have it in a proper receptacle where it will be out of sight and properly disposed of.

MAYOR LIVINGSTON MIMS, of Atlanta, Ga., evidently believes in the old adage, "If at first you don't succeed, try, try again." He continues to agitate the question of better streets for his city. He came into office with the avowed purpose of bettering the streets of his city, and if perseverance will accomplish it he is bound to succeed. We wish that mayors of other cities might be as enthusiastic along this line.

MAYOR ROSE, of Milwaukee, recently vetoed an ordinance providing for the use of the voting machine in his city. The City Council refused to accept the recommendation of the Mayor and passed the ordinance over his head, by a vote of 33 to 12. The voting machine has demonstrated its usefulness in Eastern cities, and there is no good reason why an ordinance providing for its introduction elsewhere should be defeated.

COMMISSIONER STURGIS is to be commended for enforcing the regulation prohibiting the occupation of standing room and the isles in theatres. It has excited unfavorable comment in some quarters, but, nevertheless, the position of the Commissioner is right. The Commission is wrong, however, in his attitude toward the Manhattan Fire Alarm Company. This company has served a purpose, which, while it may have been remunerative to itself, has conserved the public good and his opposition to its operation is ill advised and untimely.



According to a press report a street railway company wishes to lay its tracks along the main street of Sweedsboro, N. J., which is finely macadamized and the pride of the village. As usual, the company wishes to secure a franchise without giving any adequate return. The citizens are opposed to this proposition and are not willing that the franchise should be granted without something in return. The officials of even villages are waking up to the fact that corporations have secured in the past many privileges to which they were not entitled. We still believe that the granting of all franchises should be submitted to a vote of the people. In this way fewer expensive mistakes would be made by municipalities.

THE Chautauqua Assembly will include in its general programme this year two groups of subjects which will not fail to be of interest to our readers. One week, including July 27-August 2, will be devoted to "Municipal Progress." Negotiations are now in progress with prominent men of this country, who occupy high positions in different municipalities, to be present and speak at this group of meetings. A second week, including August 17-23, will be devoted to "Public Beauty." Prominent speakers will be provided for this special week also. In arranging for the summer vacation our readers will act wisely in planning their time so that they will be enabled to avail themselves of the privileges thus afforded.

This is the time of the year when the city forester, the park superintendent and others interested in the health and welfare of trees should give some attention to the destruction of caterpillar eggs and the nest of the brown tail moth. The Board of Trade of Lynn, Mass., has offered a prize to the Grammar School in that city collecting the largest number of nests and another prize to the room in the school with the highest average per pupil. The trees in Lynn are said to be so badly infested by the moths that ten men are employed the year round in removing and burning the nests. Other cities have interested public school children in the same undertaking. It is a practice which every city could afford to inaugurate even at some expense.

RECENT hotel fires in New York City have demonstrated more than ever the need of hand fire extinguishers and other appliances adapted to use in public buildings. We believe that every large hotel, like the Park Avenue, should have a certain number of its employees thoroughly drilled in the use of fire apparatus of this sort to be used in a case of emergency. A regulation which would require daily, or at least weekly drills, in their use might add somewhat to the expense of running one of the large metropolitan hotels, but it would have a tendency to avert disastrous fires. Not only the city authorities, but local insurance companies and associations, should have something to say about the establishment of a better code of regulations for the protection of hotels and other public buildings, and stricter provisions for the enforcement. There is no time like the present to take action touching this matter. "A stitch in time saves nine."

IN commenting upon the recent organization of the American Road Makers, the New York *Sun* pertinently remarks: "Instead of advocating good roads only in a general way, like other organizations interested in the movement for better highways, the association will favor the construction of a chain of macadamized roads connecting all the capitals of the different states of the Union with the District of Columbia. By dividing the association into four departments, namely, the Eastern, Southern, Central and Western departments, it is believed that more can be accomplished than by maintaining the organization as a unit. To begin with, only ten members will be eligible from each State. After every state has furnished this number of members, ten more may come in, and so on." After calling attention to the far-reaching character of the association as afforded by the list of names of its charter members, *The Sun* concludes by saying: "We wish the Road Makers' Association and all other associations of a similar sort abundant success."

Some capitalists over in New Jersey in the neighborhood of Elizabeth have had a dream that there would be money in establishing

a telephone system in that city and in fact throughout the country, on a one-cent-a-message basis. According to their plan the telephones will be put in any house on request free of charge. If the telephone systems of the country were under the management of the government, there would be some chance for the realization of this dream, but it will be many years before the country is freed from the grasp of the telephone monopoly. So long as New Yorkers are willing to pay ten cents a message on the Island of Manhattan, and twenty cents to telephone to Brooklyn, when the same service can be had for five cents in even small cities out West, there will not be much chance for a reduction in telephone rates in the East for many years to come. To say that the rates charged in New York for the telephone service given are excessive and outrageous is to put the matter mildly, but "it is a long road that has no turn." The time will come when we will have low rates.

UNIFORM public accounting continues to absorb the attention of some public officials; moreover, it is attracting the attention of many newspapers. A bill has recently been introduced in the Ohio Legislature which provides for a uniform system of public accounting, auditing and reporting in the state. Much the same provisions are incorporated in the Municipal Code Bill now before the Legislature. The same arguments that are advanced for incorporating this system of accounting in state offices are applicable to the municipal phase of the question. If the State can save money by the introduction of a system of uniform accounting, and if such a system is good for large private business enterprises, it ought to be beneficial to the municipality. There is only one state in the Union, and that one of the smallest in population—Wyoming—where a uniform accounting system is in operation. The experience of that State, however, has been extremely satisfactory. City officials, as well as municipal reformers, should use their influence in securing the adoption of such a system.

GOVERNOR ODELL is thoroughly committed to the cause of good roads, as he has shown by every public act since his inauguration. His recent act in vetoing a bill exempting Franklin County from the provisions of the Good Roads law should meet with general public approval. He gave the following reason for vetoing the bill:

"At the present time the policy of the State is to encourage the building and maintenance of good roads, and it annually extends financial assistance to the various towns in the State to aid them in the construction of highways. The provisions of the act in reference to wide tires is based on the theory that the use of wagons with such tires aids in the maintenance of the highways, and the rebate of taxes to those using them is for the purpose of encouraging their use. In view of the widespread demand for the improvement of the highways, it does not seem to me that it is desirable that any of the provisions which tend to accomplish this result should be nullified."

The Empire State is to be congratulated for possessing a Chief Executive who is in such thorough accord with the good roads movement.

The next meeting of the League of American Municipalities will be held in Grand Rapids, Mich., on August 27th, 28th and 29th. There were three hundred delegates registered at the last convention at Jamestown, N. Y., and it is expected that half again as many will be in attendance at the Grand Rapids meeting. Secretary John MacVicar is now arranging a program which will cover the municipal field thoroughly. There will be valuable papers contributed dealing with various problems of government, and some of the men who do the work in American cities will tell how to clean streets, collect and dispose of garbage, lay pavements, and in fact tell all about modern city housekeeping. It is to be earnestly hoped that all the large cities of our country will be well represented. The annual meeting of this league affords an opportunity for delegates to obtain information which would be the means of saving thousands of dollars in the administration of the city's affairs. For this reason the heads of department and those most interested in civic work, should be selected and sent as the accredited delegates of a city and at its expense. It would be money well invested.

Mayor Charles F. Ashley of New Bedford, Mass., who is president of the American Municipalities, made some very pertinent remarks in his recent inaugural address relative to the subject of public education. In recommending a large appropriation for the purchase of a site and the erection of a new high school building, he said: "We owe the best that can be afforded in the way of educational facilities to the present and coming generations of public school pupils, and if in acquiring such facilities we are obliged to create 'a debt for posterity to pay,' I am sure that posterity will be well satisfied to pay for the benefits which it should now receive." Mr. Ashley is not a firm believer in the Board of Public Works which operates in many of our leading cities. In commenting upon it, he said: "The chief criticism of the Board of Public Works is that it is too far removed, at least in theory, from the people. It is so with the other boards and commissions. The people are denied the full exercise of the right to select their own servants. And the Mayor and the administration are held responsible for acts and conditions over which they have no control. It seems to me that the remedy and relief from such abnormal conditions is a return to first principles. Have the people elect every official who has anything to do with the granting of money. Abolish the Common Council and enlarge the Board of Aldermen by the addition of at least two members to be elected by and from the voters in their respective wards."

## LETTERS TO THE EDITOR

### COMPARATIVE COST OF STREET CLEANING

WASHINGTON, D. C., March 10, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I read your article entitled, "The Most Beautiful City in the Middle West," in the March number of your Journal with a great deal of interest. I notice, however, that there is an error in the table of statistics of street cleaning in so far as this city is concerned. It is there made to appear that but 1,750,000 square yards of streets are cleaned by hand and machine per week, with a force of seventy-nine men and at a cost of \$174,679. These figures appeared in the Bulletin of the Department of Labor for September, 1901, but should have read 1,750,000 square yards *per day*, instead of that number per week. That was the area we cleaned up to July, 1901, at an annual cost of \$155,000. Since that time, and at present, with a force of 250 men on hand and machine work, we are cleaning 2,900,000 square yards of streets per day, at an annual cost of \$155,000. You will see, therefore, that instead of cleaning 1,750,000 square yards per week, we clean 17,400,000 square yards during that period.

About two months ago I prepared a table of statistics showing the comparative cost of street cleaning, in accordance with the area cleaned, in other cities as against the cost in the city of Washington, which is as follows:

City.	Miles paved streets.	Sq. yds. cleaned per week.	Annual cost.	Greater per cent. cost based on.	Comparative cost based on area cleaned.
Boston	491	9,000,000	\$514,490	483	\$904,000
Chicago	1300	9,500,000	292,640	247	539,000
Detroit	306	5,110,026	157,166	245	535,000
Milwaukee	310	12,848,286	170,599	56	243,000
Buffalo	335	14,963,475	278,310	122	345,000
Baltimore	376	12,118,400	209,044	95	303,000
Cincinnati	386	6,000,000	199,641	273	578,000
Minneapolis	100	10,000,000	170,091	90	295,000
Lincoln	57	490,800	7,895	80	280,000
Average				188	\$491,000
Washington	231	17,400,000	155,000		

The column headed "Greater Per Cent. Cost" represents how much more it costs to clean the respective cities named than it does to clean Washington, the figures being based on the area cleaned. The last column represents what it would cost Washington, taking into consideration the greater area cleaned, if we expended the same amount per thousand square yards that other cities do.

I think, therefore, I am justified in saying that we make at least as good a showing as any other city in the matter of cleaning streets, and certainly our expenditure for that purpose is much less.

W. STUTLER, Superintendent, Street Cleaning Dept.

We are pleased to have the correction made and also to receive the valuable comparative statistics made by Mr. Stutler.—[EDITOR.]

## SPLENDID WORK OF THE BOOK TYPEWRITER

COLUMBUS, O., March 21, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

You will please find under separate cover a reproduction of a leaf in one of the records kept in this office written on an Elliott & Hatch Book Typewriter, together with a copy of one of the cords of the card index now in use here. We use the card index furnished by the Globe-Wernicke Company, of New York and Cincinnati.

The records are easily and rapidly made in books with flat opening binding, the pages being blank with the exception of the headlines and number, with no marginal lines. By this method of recording much space is saved, thereby reducing the number of books required, to say nothing of the time saved in actually writing the records. A great advantage is gained over handwriting, in the way

AREAWAYS	Date Passed 1901	Mis. Ord Rec. No. 12 Page
Construction, providing conditions of	Dec. 2	158
Conditions under which constructed	"	"
Oak & 18th Sts., N.W. Cor., Asa Billings	"	159
4th St., S.W. Cor. Capital St., R.H. Hamilton	1902 Feb. 3	182
4th St., N.W. Cor. Noble Alley, C.F. Myers	"	183

SAMPLE OF CARD INDEX

158

### AN ORDINANCE NO. 19089

"Providing conditions under which covered areaways may be constructed under the sidewalks of the City of Columbus, Ohio.

BE IT ORDAINED by the City Council of the City of Columbus, Ohio, as follows, to-wit:

Section 1. That any person, persons, firm or corporation, owning real estate in the City of Columbus, Ohio, may be given the right to construct and maintain covered areaways under the sidewalk abutting said real estate, under the direction of the Chief Engineer and subject to the approval of the City Building Inspector of Columbus, Ohio.

Section 2. That ordinances and regulations

and that said instructions be filed with the Recorder of Deeds in Columbus County, Ohio, for record

Section 3. This ordinance shall be in full force and effect from and after its passage and publication according to law.

PASSED DEC. 2, 1901

A. M. Shonaker

Approved by the Mayor DEC. 3, 1901.

Vice President of the City Council.

Attest: John T. Barr, City Clerk.

I HEREBY CERTIFY THAT the foregoing Ordinance No. 19,089 was published in the Daily Ohio State Journal, Columbus Evening Press and Daily Westbote, newspapers published and of general circulation in the corporation, on the following dates, to-wit: Dec 5 & 6, 1901.

John T. Barr  
City Clerk.

of legibility as well as in the reduction in the time necessary for making search of the records because of fewer books to handle.

Each ordinance may be indexed under as many heads as may be convenient or necessary, on the card index which has proven very satisfactory and an improvement over the former system of indexing in books. Card index of council proceedings as found in the journal, is quite a help in locating documents which have been presented to Council but have not been passed and made a matter of record in full.

E. PETTIT, Asst. City Clerk.

## HOW TO REMOVE ROOTS FROM SEWER PIPES

ROLAND PARK, Md., March 15, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

There have been many questions asked by engineers and superintendents about how to get rid of stoppages in small sewers caused by roots and other foreign matter. Little or nothing has been written how to remedy this trouble. About five years ago I accepted the position of superintendent for a suburban land improvement com-



pany, and during the first year I encountered quite a good deal of trouble with our sewers getting choked. The sewer line was laid with six-inch terra cotta pipe for about six miles in length, with but very few manholes, and each time it got choked we had to dig up the roads to find the trouble, which was generally caused by roots growing in through the joints of the pipe. This digging was rather expensive, especially in the winter, our sewer being from five to fifteen feet deep. Besides it took quite a little time to open it.

I consulted several engineers in reference to some remedy to get rid of this trouble, but all suggested the only remedy would be to relay the sewer. To save this great expense I began to experiment, endeavoring to get some tool which would clean out the sewer without digging up the streets. I constructed manholes every five or six hundred feet, then made the necessary tools to clean them out. These cost about fifty or sixty dollars for the complete set. I then had the whole line thoroughly cleaned, which took four men about two weeks. By going over our line twice a year I find that we can keep the sewer in good condition. The device is simple and inexpensive and does the work very well. This same tool can be made to clean out any small sewer from four to ten inches in size. It is almost impossible to lay pipe with a cement joint that will keep out these very small fibrous roots. They are not any thicker than a needle when they enter, but when once in and fed by the sewerage, they grow quite rapidly until they fill the pipe up.

THOMAS STROUSE, *Superintendent.*

## TERMS OF STREET RAILWAY FRANCHISES

MONTREAL, Canada, March 18, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Being one of your subscribers I take the liberty of seeking information through your assistance. Can you direct me to any statement which will give me the length of franchises enjoyed by various street railway companies throughout the principal American cities?

HERBERT B. AMES, *Alderman.*

In response to the above and inquiries along similar lines from others, we give the following information which has been compiled from franchises in actual operation in American cities. We would be glad to add to this and, therefore, will be pleased to have our readers send us the terms of street railway franchises in other cities.—[EDITOR.]

### Canton, Ohio

The electric railway which connects the city of Canton with Massillon, Ohio, has a franchise for twenty-five years. It is obliged to relay, at its own expense, all pavements removed in a manner satisfactory to the City Engineer.

The Street Railway Company has a franchise for fifty years on several streets of the city of Canton. The rates of fare are as follows: Single, five cents; commutation tickets, twenty-four for a dollar; twelve for fifty cents; six for a quarter. Transfers are good on route of Massillon Street Railway. Children under ten are charged three cents; those under five years, accompanied by parents or guardian, are carried free. Double fares can be charged from 11 P. M. to 5 A. M.

### Newcastle, Pa.

Single tracks shall be laid in the center of the streets and double tracks as close together as possible. The "L" tram or girder rail, is to be laid in all unpaved streets and of the grooved pattern in paved streets. In the former the rail is to be not over one inch above surface; in latter, flush with surface. The Company is required to relay pavements between tracks and twelve inches on either side, keeping the pavement in good repair—pavement to be the same as on the rest of the street and satisfactory to the City Engineer. The Company is also required to keep the pavement between tracks sprinkled and clean, and in case of failure to comply with these conditions the work shall be done by the city and charged to the Railway Company. All overhead wires and poles may be removed by an order of the Council.

When the earnings of the Company warrant, the City Council may reduce the five-cent fare now charged. The property of the Company is taxed at the rate of other property and is subject to any other tax which may be authorized by law. The franchise of this company is for twenty-five years.

### Norfolk, Va.

The Bay Shore Terminal Company, operating in this city, is required to relay from curb to curb all pavements disturbed by the laying of its tracks. It is also required to keep in order the pavement between tracks and two feet on either side, all work to be performed under the supervision of the City Engineer. School children are carried at half-fare. The length of franchise is unknown, but it is not exclusive and is subject to general ordinance regarding electrolysis. The Company is required to pay the city \$30,000 in installments of \$1,000 annually, which would seem to indicate that this franchise extends for thirty years.

### Auburn, N. Y.

The Street Railway Company is required to keep its rails flush with the pavement and grade of streets at all times. If the Company abandons any street the pavement must be replaced after the rails are removed. The grooved rail must be used, subject to the approval of the Committee on Streets. The Company is required to repave between the tracks and two feet on either side. In winter the Company is required to remove snow from tracks and either remove it from the street or spread it evenly on the side. The use of fenders is obligatory, the pattern of which must be approved by the Council. The single fare is limited to five cents. The Council reserves the right to order a change of system if a more approved system is desired.

### Grand Rapids, Mich.

There are four street railway companies operating within the city, with franchises ranging from twenty to fifty years. They are required to pave between the tracks and eight inches on either side, maintaining the same in good repair. Snow is to be removed from the tracks and spread evenly on either side or removed altogether, as the Council may order. Salt may be used on the rails only at switches and at grades. A license is paid for each passenger or baggage car annually. Within the fire district the poles supporting the trolley wires are required to be made of iron and kept neatly painted. All passenger cars must be modern, heated, lighted, vestibuled, equipped with life guards, signs and numbers. Single fares are limited to five cents, with transfers to all other lines. Cars are given the right of way on all streets. In addition to the license fee of five dollars per car, one of the companies is obliged to pay 2 per cent. of its gross earnings per year to the city, with the proviso that it shall never be less than \$500. The speed of all cars is limited to seven miles per hour in the business streets and ten miles elsewhere. In the franchise of one of the companies, the city has the right, after fifteen years, to purchase the road at a fair price upon six months notice to the Company.

### Denver, Col.

One of the street railway companies operating in this city has a novel provision requiring the Company to carry bicycles on the cars to the extent of three on each car, when accompanied by the owner. A charge of five cents for each wheel is allowed and a transfer is given by the Company for the wheel the same as for a passenger.

### Springfield, Mass.

The Street Railway Company is required to pay two and a quarter per cent. on gross receipts annually, but is not required to pave between the tracks. A straight five-cent fare is charged. Transfers are given to all lines.

### St. Paul, Minn.

The poles and wires are to be erected under the supervision of the City Engineer. The Company is required to pave between the tracks and two feet on either side, and keep the same in repair. Snow is to be removed from the tracks within twenty-four hours after the fall to the satisfaction of the City Engineer. In case of fires the wires of the Street Railway may be cut at any point, the repairs to be made at the Company's expense. Fares are limited to five cents. Children under five years of age, with parent, ride free. Free transfers to

other lines are given. An annual license fee of \$10 for each car is charged. In addition, the Company shall pay a sum of money equal to the difference between the amount of the general taxes payable each year upon property necessary to the operation of the lines, and an amount equal to three per cent. of the gross annual earnings of the Company in the years when such three per cent. shall exceed the general taxes. The Company has a franchise for fifty years.

#### Richmond, Va.

The Company is required to pave between the tracks and for two feet on either side and maintain the same in repair without reference to the rest of the street. The fare is limited to five cents; six tickets are sold for a quarter. Children under five, when accompanied by an older person, ride free except where more than one child is with one older person, when the fare shall be one for two children. Free transfers are given to intersecting lines. Conductors are obliged to sell tickets on the car. From 6 A. M. to 7 P. M. on week days, tickets are sold at the rate of two for five cents, to be used between those hours. The Company is also required to keep on sale in all parts of the city tickets for the use of school children at the rate of two for five cents, to be used between the hours of 8 A. M. and 4 P. M. from Monday to Friday inclusive. The Company must pay a sum equal to three and one-half per cent. of its annual gross earnings until the earnings shall reach \$350,000; then an amount equal to five per cent. up to \$450,000; then seven per cent. up to \$550,000; then ten per cent. over and above \$550,000, payments to be made semi-annually, and if payment is not made within ten days from the time it is due, a fine shall be imposed, and if not within thirty days the cars shall be stopped.

#### Haverhill, Mass.

The general construction of the railway must be approved by the Mayor and Board of Aldermen. The pavement must be laid and maintained between the tracks and eighteen inches outside at the expense of the Company. The fare is limited to five cents. Snow must be removed from the tracks and from the roadway adjoining the same. Proper toilet rooms for ladies and gentlemen must be provided in waiting rooms. All motormen and conductors must have licenses granted by the Board of Aldermen, a fee of twenty-five cents being charged for each.

### HOW TO MAKE CONCRETE REPAIRS

MONTREAL, CANADA, March 7, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

After filling in a cut made in a permanent pavement, what length of time should the ground be allowed to settle before laying the concrete for repairs?

Is it possible to make earth as solid as Nature does by a proper filling, packing, ramming, etc., so as to have the repairs done immediately, without waiting the action of the weather and the traffic?

ERNEST BELANGER, *Deputy City Surveyor*.

The practice in New York, London, Paris, Berlin and other cities with which I am familiar, is to have the earth shoveled back slowly in layers not to exceed six inches, while at least three men use iron rammers consolidating the replaced earth for each man who shovels the earth back into the cut.

It is thus possible to consolidate the earth, of whatever nature, and without water, so that it is more solid than the original earth which was removed from the cut. It often happens that more earth will be needed to refill a cut made to gain access to an existing sewer, water or gas pipe than was removed from the cut; that is, if the ramming is thorough and done in thin layers. It is good practice to thus consolidate the earth by ramming and to replace a concrete foundation of a pavement over the cut immediately after it has been refilled with earth as above described. With an intelligent, trained foreman in charge, it is possible to replace the earth and relay stone block, or other pavements, over the repaired cut mentioned so that after the work is done the concrete will not settle. Puddling with water is seldom, if ever, good practice in consolidating refilled cuts in city streets or roads of any kind.—[ENGINEERING EDITOR.]

### CONSTRUCTION INFORMATION WANTED

PARKVILLE, Mo., March 14, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I write to make inquiry regarding water works construction. Can you or any of your readers direct me to a successfully constructed settling basin built of stone above ground? Our water works at Parkville are proving highly satisfactory except that we find difficulty in holding the water in our settling basins. Because of the nature of the soil it seemed best to build them of masonry above ground. I know of no similar construction, but supposed our engineer competent, and followed his directions.

H. B. McAFEE, *Mayor*.

We know of no reservoir constructed as you describe. Some of our readers may know of such a form of construction and we would be glad to have them answer the query of Mr. McAfee.—[EDITOR.]

### PERSONALITIES

—Mr. George I. Leland has been elected City Engineer of Lynn, Mass.

—Mr. Malcolm D. Patterson has been elected City Engineer of Northampton, Mass.

—The city of Salt Lake, Utah, has a new City Engineer in the person of Mr. A. F. Parker.

—Mr. F. J. Parkes has been elected to the position of City Engineer of Bessemer, Ala.

—Mr. A. B. Stevens has been appointed to the position of City Engineer of Jackson, Mich.

—At Corning, N. Y., Dr. John L. Miller, Republican, was elected Mayor by a substantial majority.

—The Democrats of Hornellsville, N. Y., elected Mr. F. J. Nelson Mayor over W. S. Newman, Republican.

—Mr. F. A. Raht has been elected president of a Good Roads League recently formed at Tullahoma, Tenn.

—Mr. Hiram H. Sandford has received the appointment as Superintendent of Sewers at Newburyport, Mass.

—Mr. Daniel Sheehan, Democrat, was elected to the mayoralty of Elmira, N. Y., over Webster J. Cole, Republican.

—Mr. W. J. B. Stokes, City Treasurer of Trenton, N. J., has successfully passed through an operation for appendicitis.

—Former Mayor William F. Lott was defeated for the office of Mayor of Hightstown, N. J., by Mayor Richard D. Norton, who was re-elected.

—Mr. Lee H. Patton was elected City Engineer of Huntsville, Ala.

—Spokane, Wash., has a new City Engineer in the person of Mr. P. F. Byrne.

—Mayor G. A. F. Bleau of St. Boniface, Can., has resigned owing to poor health, which prevented his attending the meetings of the Council.

—Mayor Louis F. Walther of Georgetown, O., committed suicide on March 5th by hanging himself with a strap. He attempted to end his life some time ago but was prevented.

—Mayor Charles Shilling of Decatur, Ill., who was charged with malfeasance in office in allowing gambling rooms to exist, Sunday liquor selling, etc., has been acquitted of all charges.

—The Mayor, and three Councilmen of the city of Mascoutah, Mo., have been indicted, charged with malfeasance in office for allowing certain accounts in which city officials were interested.

—Mayor H. T. Duncan, of Lexington, Ky., has been contributing weekly statements to a local paper for its Sunday edition. He takes this means of giving his views regarding affairs of his city.

—Hon. Isaiah T. Montgomery of Mound Bayou, Miss., is the only colored mayor in the United States. He is the wealthiest man in the place and was born a slave on the plantation of Jefferson Davis.

—Mr. Abram Garfield, youngest son of the late president and a member of the firm of architects of Meade & Garfield, has announced himself a candidate for Councilman on the Republican ticket in Glenville, O.



—Mr. and Mrs. C. O. Newton, of Homer, N. Y., have presented the village with the plant of the water works. They purchased it from the company at \$52,500. Mr. Newton had already given the village an old ladies' home and a hospital.

—Mayor Henry C. Steeg, of Terre Haute, Ind., has announced that he is a candidate for re-election on the Democratic ticket. Mayor Steeg is very popular with all classes and stands a good chance of serving another term should he be nominated.

—Mayor Jay B. Kline of Syracuse, N. Y., has appointed ex-City Clerk Henry F. Stevens as an expert accountant to examine the books of the city. The work will be very broad and will cover the transactions of administrations for the last few years.

—Major John M. Woodbury, Commissioner of Street Cleaning of New York, has been appointed a special policeman and is nominally assigned to the Mayor. He asked for this appointment so that he would have more power to arrest persons for violating the street cleaning regulations.

—Mayor H. K. Bentley, who has been elected to the chief office in Monongahela, Pa., is one of the youngest mayors in the country, being only thirty-two years of age. He has been successful in politics and has held several state and county appointments in his party. He is a Republican and promises that he will conduct the office on broad grounds.

—Mayor William Redden of Smithland, Ia., has been sued for \$1,000 for false imprisonment by W. R. Brown of that place. While under the influence of liquor, Brown pushed the mayor off the sidewalk and was fined \$100 by the Mayor after being locked up in jail over night. As reason for the suit, Brown declares that he was imprisoned and tried without any information being filed.

—Mayor John F. Hurley of Salem, Mass., has announced that he will be a candidate for nomination by the Republicans as Congressman in the Sixth district. He is against "rings" of all sorts and kinds as well as the "trusts." He is for good money and the gold standard and for free Cuba. On the other important questions before Congress he is not yet quite decided, but will shape his opinions when he reaches Washington.

—The number of unsightly telegraph and telephone poles that disfigure the streets of St. Joseph, Mo., has called forth a statement from Mayor Combe that all such poles should be taxed, for this would tend to cause their removal. The Mayor thinks that all wires in the business district should be placed under ground, for they detract from the appearance of the city and are a menace to life in the event of big fires.

—City Clerk D. J. Coutant of Newburgh, N. Y., writes that Mr. Charles Caldwell has resigned the position of City Engineer on account of ill health and that he is succeeded by Mr. Everett Garrison, his partner. Mr. Garrison is a member of the American Society of Civil Engineers and was chief engineer of the Delaware Construction Company, of the Mackinaw system of railroads and of Newburgh, Dutchess and Connecticut Railroad.

—Mayor Mark M. Fagan of Jersey City, N. J., is interested in three bills before the Legislature relative to free concerts, free baths and free dispensaries. The Mayor has made a strong plea for their passage for he considers them as productive of great good. Chief of Police Benjamin Murphy says that free concerts and baths would aid in preserving law and order for they would afford innocent amusement, and this is a preventive of crime.

—Mrs. Charles W. Pardee has presented the city of Buffalo, N. Y., with a beautiful fountain and resting place to be placed in one of the small squares. The fountain will be of granite and be in the centre of the park and paths will be laid out and benches placed along them.

—As a result of the investigation of the accounts of City Clerk Clement B. Jones, of Jamestown, N. Y., that officer has resigned. His accounts were behind about \$250, but this he promptly made good. He is a candidate for re-election.

—Mayor Low of New York City has appointed Mr. Nelson P. Lewis to the position of Engineer to the Board of Estimate and Apportionment at a salary of \$7,500 a year. Mr. Lewis was Chief Engineer of Highways in the Borough of Brooklyn before that department was abolished under the new charter of the city. He will pass on all engineering projects that involve the expenditure of money, but will not have any detail engineering work to do. The

position is one of great importance as the Board of Estimate has charge of the budget of the city.

—The fifth annual message of Mayor Samuel S. Jones of Toledo, O., contains some recommendations that exploit the Mayor's well-known ideas. He recommends municipal ownership of all public utilities, a new charter, the abolition of the police court on the score of economy, three-cent fares and universal transfers in exchange for street railway franchises, the abolition of the license system, including the wheel tax, huckster license, license for fortune telling and the tax on employment bureaus, erection of street signs, burning of the city garbage, pure water investigation and the inadvisability of a building inspector, as the Mayor, City Engineer and Chief of the Fire Department constitute a board of inspection under the old law.

—The death of Dr. Edward Mott Moore of Rochester, N. Y., has called forth the most profound expressions of grief on the part of all citizens of that city. Dr. Moore has been called the "Father of Rochester's Parks." He was the first president of the Board of Park Commissioners and has been re-elected annually. At a meeting of the Board to take action on his death resolutions were adopted characterizing him as "the father of the park system, an eminent scientist, a loyal citizen, a courteous gentleman, and a true and earnest friend." Resolutions were adopted by the Monroe County Medical Society, the Rochester Hospital Medical Society, the executive committee of the University of Rochester, the Chamber of Commerce, the Red Cross Society, the Rochester Health Association, of which Dr. Moore was considered the founder, the Practitioners' Society, the directors of the Rochester Athenaeum and Mechanic Institute, the trustees of the Reynolds Library, of which Dr. Moore was president, and the Rochester Pathological Society. Dr. Moore's life was one of self-sacrifice and his disinterested service to the city endeared him to all. Besides doing everything in his power for the advancement of the city, Dr. Moore stood high in his profession, as evinced by the resolutions of the many medical societies. He died full of years and honor and esteemed by all.

## CONVENTION DATES

### MAY

The Good City Government National Conference will be held at Boston, Mass., May 7-9. Clinton Rogers Woodruff, 703 North American Building, Philadelphia.

The Chiefs of Police Association of the United States will meet at Louisville, Ky., on May 7. Major Richard Sylvester, President, Washington, D. C.

Alabama League of Municipalities will hold its annual convention at Montgomery, May 8-10. Hon. W. M. Drennen, Birmingham.

The American Civil Engineers' Society will meet at Washington, D. C., May 20-27. Charles Warren Hunt, New York City.

The American Society of Mechanical Engineers will assemble at Boston, Mass., May 27.

Charities and Correction National Conference will be held at Detroit, Mich., May 28 to June 3. Homer Folks, 105 E. Twenty-second street, New York City.

### JUNE

The American Water Works Association will hold the twenty-second annual convention at Chicago, Ill., June 10. Peter Milne, 99 Nassau street, New York City.

The American Institution of Electrical Engineers will meet at Great Barrington, Mass., June 24-27.

### AUGUST

The tournament of the Illinois Firemen's Association will be held at Blue Island, Ill., August 5-7. Walter E. Price, Champaign, Ill.

The League of American Municipalities will hold the annual convention at Grand Rapids, Mich., August 27-29. Hon. John MacVicar, Des Moines, Iowa.

### SEPTEMBER

The Association of Chiefs of Police of the Pacific Slope will meet at Portland, Ore., September 16. Chief Hodgkins, Oakland, Cal.

### OCTOBER

The annual convention of the American Society of Municipal Improvement will be held on October 7-10 at Rochester, N. Y. E. A. Fisher, President, Rochester, N. Y.

## CURRENT NEWS AND PRACTICE AMONG THE CITIES

**Municipal Insurance—A City Bill Poster—"Tree Doctor" for Brooklyn—Wood Pavements in Edinburgh—Sewage Disposal in Toronto—Boston's Printing Plant—Newark's Efficient Excise Board**

**MUNICIPAL INSURANCE.**—Mayor Burr, of Middletown, Conn., has recommended that the city insure its own property. He points out that premiums paid during the last twenty-five years were enough in excess of losses incurred to provide all the running expenses of the city, pay the interest on the bonds and render no taxes necessary.

**FENDERS MUST BE USED.**—After June 1st, all trolley cars in Atlantic City, N. J., must be equipped with fenders of the most approved type. The number of accidents that have happened lately due to the trolleys have brought the matter to a head. If the cars had been supplied with good fenders the number of accidents would have been greatly reduced.

**SMALL RETURN FOR VALUABLE FRANCHISE.**—The city of Rochester receives something from the railway company for the use of the streets. It is not much, but it is better than no return at all. The company pays one per cent. of its gross earnings per year and a tax of \$5 for each of its 109 cars. The return to the city for the last fiscal year amounted to \$9,882.35.

**TO FURNISH CHEAP GAS.**—The Council of the city of Cohoes, N. Y., has granted a franchise to a company to erect and maintain a plant for the manufacture of gas and electricity. The company agrees to furnish gas for fuel and lighting to the city and public buildings at a rate not exceeding 50 cents per 1,000 feet. The rate to private consumers shall not exceed \$1 per thousand. This is 50 cents less than that charged by the old company.

**MUNICIPAL OWNERSHIP IN CANADA.**—During the recent elections in Ontario the growing popularity of public ownership of public utilities was well demonstrated. Ottawa voted to own its own telephone service and another city its electric lighting. A scheme is on foot to transfer the telegraph lines of the Dominion to the Post Office Department. Canada is the only portion of the British Empire that does not own its telegraph service.

**"WHITE WINGS" FOR ST. LOUIS.**—St. Louis, Mo., has joined the list of cities employing "white wings" on its street cleaning force and one hundred men have been dressed in the regulation white duck suits and set to work on the streets in the business section to keep them clean. This number is only the starting of the improvement and the entire force will be uniformed as fast as possible. In addition to the white blouse and overalls, the men will wear gray-black rimmed caps.

**NEW METHOD TO DETERMINE SPEED OF CARS.**—A unique method has been adopted by the Council of Miamisburg, O., to determine the speed of the electric cars on its streets. The city ordinance places the maximum rate of speed at six miles per hour and it is stated that a man, who can walk at that rate, has been engaged to keep watch on the cars. He walks along the track and, if he cannot keep up with any car, he reports the fact to the Council, which takes up the matter with the railway company.

**MUNICIPAL OWNERSHIP NEEDED.**—"Water, water everywhere and not a drop to drink" applies to the town of Frackville, Pa. On account of a dispute between the water company and the Borough Council the company has turned off the water supply from the whole place and stated that it would not turn it on again until the summer. The hotel and factories are crippled and private families have to carry water in pails for long distances. The citizens will take legal measures to compel the company to turn on the water.

**NO LAMPS ON BICYCLES.**—Mayor Byrne, of Spokane, Wash., has vetoed an ordinance which required that lamps should be used on bicycles at night. The Mayor stated that a petition of 1,200 names had been submitted to him asking the veto and His Honor had decided that the lamp is no protection and that there is more safety without it. Ordinances are now in force forbidding persons from riding bicycles within the fire limits faster than eight miles an hour, and that each wheel shall carry a bell to be rung at crossings and at all places of danger.

**WILL NOT PERMIT SIDEWALK SIGNS.**—The Commissioner of Public Works, of Rochester, N. Y., J. Y. McClintock, has notified all merchants and others having buildings on the streets of the city to remove all signs on posts or otherwise such that they hang over the walks. Bicycle racks must be of uniform size and color and must not exceed two feet six inches in height and two feet six inches in length. The color must be a dark green, there must be no signs on them, and they must be kept in repair. Already several persons have been fined for violating this order.

**HUNTING TAILS.**—In the city of Richmond, Va., there is a standing offer by the city of ten cents for every musk-rat tail delivered to the authorities. At a recent meeting of the Water Committee an item of \$2 was ordered paid for this purpose. In answer to an inquiry, the Superintendent stated that the musk-rat hunters had done a good business lately. He said further that the musk-rat was a "pesky varmint" that digs holes in the river banks and canals and that they occasion much damage to dams and other things in connection with the water department.

**CITY MAKES FAIR BARGAIN.**—The city of Harrisburg, Pa., has granted a franchise to the Paxtang Electric Company to erect lines and operate them in the city. In return for the franchise rights the company pays the city a bonus of \$5,000 and agrees to furnish free 100 sixteen candle-power incandescent lights. Not more than \$70 per year is to be charged for arc lamps of 2,000 candle-power and for the faithful performance of the terms of the contract the company has filed a bond of \$25,000. The city engineer and the highway commissioner are to supervise the erection of the plant.

**CITY TO OPERATE STREET RAILWAY.**—The Supervisors of the city of San Francisco, Cal., have taken the initiatory steps in the building of a street railway system to be owned and operated by the city. A resolution was passed declaring that it was the Board's intention to commence and complete, as soon as the law will permit, a modern electric street railway on certain streets in the city. The City Attorney has been asked to advise the Board as to its rights in this matter upon every question involved in order that nothing will be done to prevent the undertaking.

**PORTABLE SCHOOL HOUSES.**—The overcrowding of the public schools in Cleveland, O., is being met in a novel but satisfactory manner. Portable school houses have been obtained at a cost of \$1,350 each. They are fifteen feet high, twenty-six feet wide and thirty-four feet long. The sides of the building are in six pieces and the ends in five. All of these as well as those composing the floor and roof are numbered and the building can be taken apart, transported to another part of the city and there set up in short order. Especial attention is paid to ventilation and lighting, although the windows are not found on all sides.

**SAFETY AIR CUSHION.**—An ordinance has been introduced into the Board of Aldermen of New York requiring that an air cushion shall be constructed at the bottom of every elevator shaft



and this shall be strong enough to withstand the air-pressure developed by the car, falling from its maximum height with its maximum load. The cushion must be at least one-sixth the total length or the shaft with a minimum length of six feet and shall have proper air escapes. All doors of this cushion shall be self-closing. All cushions shall be tested by dropping the car from its highest point of travel to the cushion below without damage to the car or its contents.

**UNIFORM PUBLIC ACCOUNTING.**—A member of the Ohio Legislature has introduced into the House a bill to establish a uniform system of public accounting, auditing and reporting in the State. The Ohio State Board of Commerce is responsible for the bill and has the support of influential business men. In substance the bill provides that every public officer in the State, including every state, county, township, city and village officer who handles any public funds shall use the same system of accounting and shall make monthly statements to the State auditor to have them audited and made public. In addition each office shall receive an official examination yearly by the State Examiner. It is hoped that this measure will introduce business principles into public bookkeeping.

**SUCCESSFUL GARBAGE DISPOSAL PLANT.**—A type of the modern garbage disposal works is furnished by the Borough of Bermondsey, London. The district is very much crowded and filled with factories. The destructor has a capacity of fifty tons of garbage per day, the material being dried before burning. The heat from the combustion is used to furnish power to run dynamos that supply the district with electric lights and power. All gases are rendered innocuous before escaping. Even the refuse, after the garbage has been burned, is not wasted for it is converted into flags suitable for paving. What one place can do another can do and it is a foregone conclusion that the time is coming when all cities will dispose of their garbage and refuse by means of reduction or destructor plants.

**BOSTON'S PRINTING PLANT.**—According to the report of the expert employed by Mayor Collins, of Boston, to investigate the municipal printing establishment, municipal printing is not a profitable venture under the existing conditions. The accountant went through the plant, examined the accounts, presses and stock and reported that there was a deficit of about \$40,000 as a result of the five years' operation of the plant by the city. Incompetency of employees and the large amount of paper and ink on hand were pointed out by the expert as factors of the failure. The plant was established by Mayor Quincy five years ago and the present superintendent, Mr. Whalen, who started the plant in the beginning, and who was removed by Mayor Hart, has been appointed by Mayor Collins to try and put the plant on a business basis.

**SEWAGE DISPOSAL IN TORONTO.**—By order of the City Council of Toronto, Ont., City Engineer Rust has prepared an estimate of the cost of disposing of the city's sewage by two plants, one located in the eastern and the other in the western portion of the city. The whole system will cost \$1,880,000. The western plant is to cost \$527,000, divided into \$61,000 for sewers, \$8,500 for a pumping station of 13,500,000 gallons daily capacity, \$143,400 for a septic tank, and \$374,000 will be devoted to bacteria beds, including the material for filling and filtering. The eastern plant will cost \$1,352,600, made up of \$500,000 for bacteria beds to cover thirty acres, \$250,000 for a twelve acre septic tank, \$240,000 for an intercepting sewer and the balance for an interceptor and a siphon under the Don River. The annual cost of operating has been estimated at \$12,000 for the western plant and \$28,000 for the eastern.

**A CITY BILL POSTER.**—The city fathers of South Omaha, Neb., have passed an ordinance creating the office of city bill poster, the incumbent to be appointed by the mayor and confirmed by the council. The office is for two years, but not to exceed the term of the appointing mayor. A bond of \$1,000 is required. He shall supervise or conduct the posting of all bills or advertising matter, shall regulate and supervise all sign boards and similar structures and can cause the removal of any such structures he may consider dangerous to the public thoroughfares. He shall not allow any immoral or

offensive signs to be posted. No bills shall be posted except with the consent of the owner of the property. No person shall post any bills or signs, except those who personally place bills or signs on their wares or business, except the bill poster or agents. A fine of \$50 is placed on all violators of this ordinance. No pay is to be received by the bill poster from the city, but he may collect fees from persons served. For erecting sign boards, etc., prices are to be agreed upon; for posting bills, etc., the prevailing bill poster schedules.

**BAD MUNICIPAL ACCOUNTING.**—For the past year the city of Milwaukee, Wis., has had an expert accountant examining the city's system of bookkeeping and the city's financial transactions. The report shows that the city's finances are in a tangle and that, unless a remedy is provided, the complication will be serious. Since 1881, when the system of bookkeeping was changed, the city has spent in anticipation of its tax collection about \$215,000 in excess of what really was collected. This was due to the faulty manner of keeping tax accounts and the records of taxes bid in by the city. The system has been to borrow money before the return of the treasurer's warrant and then pay the indebtedness when the money was turned over to the city. The record of taxes bid in by the city are outlawed and a total loss. There have been about \$69,000 of these outlawed certificates and the property, which might have been turned over to the city, was never further considered. The three cardinal faults in the system shown by the investigation are: the method of keeping the tax accounts; the absence of registry orders payable in the treasurer's office; the absence of complete reports of entries which do not originate in the treasurer's office.

**COST OF JOLIET'S STREET IMPROVEMENTS.**—Some interesting figures appeared in the report of City Engineer Stevens, of Joliet, Ill., relative to the cost of street improvements. Contracts were generally let at a stipulated price per square yard for pavement, per linear foot of curb and per cubic yard of excavation. Excavation, with a maximum haul of 2,000 feet, costs thirty cents. Four-inch limestone curb, thirty inches deep, dressed and set in place, is worth 37 cents. Asphalt varied from \$1.51 per yard in 1899, when 60,000 yards were laid, to \$1.70 per yard in 1900, at which rate about 17,000 yards were put down. Brick, under present specifications, costs \$1.35, while macadam, of an average thickness of nine inches, is laid for 50 to 60 cents per yard. Pit gravel, loaded on the wagon at the bank, is worth 10 cents and sand 50 cents. Crushed limestone at the crusher brings 75 cents and is delivered on the work under a city contract for 95 cents. Ordinary labor is paid from \$1.50 to \$1.75, varying with the demand. Union rates for team and driver are \$3.50 per day. There are about seventy-two miles of streets within the city limits, of which 15.6 miles are paved with macadam, 3.6 miles with asphalt; 3.3 miles with brick; .6 miles with cedar block.

**PROPER RETURN FOR USE OF STREETS.**—The City Council of Montreal, Can., has granted a franchise to the Montreal Terminal Electric Railway to run cars over the streets on the following conditions: Twelve tickets must be sold for 15 cents for school children; ten tickets for 25 cents during working hours, including the hours from 5:30 to 8 A. M., and 5 to 7:30 P. M.; ordinary tickets will be sold at the rate of six for 25 cents. The company is to pay 1 per cent. of its gross earnings up to \$100,000, 2 per cent. from \$100,000 to \$200,000, 3 per cent. from \$200,000 to \$300,000, and so on, adding 1 per cent. for every \$100,000. The contract is to run for five years, the city to have the right, after giving six months notice, preceding the expiration of the five years, that it will assume the ownership of the lines on the payment of their value, exclusive of the value of the franchise. The price is to be determined by arbitration, the arbitrators to be three, one appointed by the city, one by the company and the other by a judge of the Superior Court of Montreal. These arbitrators have the power to add 10 per cent. to the price of the lines to cover the franchise. If the city does not buy the lines, the company must remove its rails, plant, etc., at its own expense and put the streets back in the same condition in which it found them.

**WOOD PAVEMENTS IN EDINBURGH.**—On account of the heavy traffic in the principal streets of Edinburgh, Scotland, and the noisiness of the granite pavements, citizens are asking that wood pavements be laid in place of the granite. From the point of economy the officials are not disposed to extend the use of wood, the price for wood on a concrete base being \$4.10 per square yard and that for granite on the same base \$3.60 per square yard. The blocks of wood used are of Australian "jarrah" hard wood and are not creosoted. The life of these blocks is about ten years, while, with one or two resettings, granite will last thirty years according to the City Road Surveyor. That the city is using an inferior wood pavement and paying a very large price for it at that, will be seen when it is compared with the creo-resinate wood block being laid in the United States. The best of this pavement has been laid at \$3.25 per square yard and will last twenty years. Edinburgh has eighty-two miles of granite streets, two miles of wood pavement and about eighty miles of the best macadam. On account of the broken, hilly character of the whole area of the city, no asphalt has been laid, as its slipperiness renders it unsafe for ordinary traffic. Should the creo-resinate wood be laid, however, this slipperiness would not be present, while the noise and unsanitary nature of the granite would be avoided.

**MEETING OF THE AMERICAN WATER WORKS ASSOCIATION.**—Chicago will be the next meeting place of the American Water Works Association, which will assemble there for its twenty-second annual convention on June 10th. Members are urged to increase the membership in the organization and every one is asked to prepare a paper in relation to any topic or phase of water works work or experience, no matter how brief, so long as it is practical and adapted to the object sought, the expression of experience. While no restriction will be placed on the presentation of papers, a few subjects have been suggested. These are the continuation of the subject of "filtration"; "fire service," relative to the placing of the hydrants nearer together, which would do away with long lines of hose and so lessen the friction and increase the pressure; an analysis of the various uses of water especially as affecting the "daily consumption per capita," bringing in the use of water for both public and private use; "watershed characteristics" including rainfall and the average yield per day per square mile of shed; "driven wells," their yield and impairment due to the drawing down of the natural levels of the saturated bed; "pumping machinery." Copies of papers should be sent to the Secretary, Mr. Peter Milne, by May 1st. Particulars as to transportation and hotel accommodation will be given later.

**"TREE DOCTOR" FOR BROOKLYN.**—It is probable that before long the Borough of Brooklyn, city of New York, will have a regularly appointed "tree doctor" to inspect and properly direct the work of caring for the trees of the City of Churches. "Tree doctor" is a new profession, but is most important to any city that rejoices in such an abundance of fine trees as graces Brooklyn's streets and parks. It is the business of the "tree doctor" to understand thoroughly all the diseases from which trees suffer and what are the causes of each disease. He must know what trees can thrive in certain surroundings, which ones can stand crowding and which must have light and air. Heretofore the trees of Brooklyn—and those of other cities—have been left to the tender mercies and the ignorance of city employees who know as much about the care of trees as a cat does about municipal government, but now it is proposed that the "tree doctor" be appointed and that he mark each tree with a card showing the exact work that is to be done on it or indicate what limbs are to be pruned. No one will be allowed to cut off limbs not marked by the "doctor." Mr. Samuel Parsons, who has reported on the trees on Boston Common, was proposed for Brooklyn's "doctor," but has been appointed landscape architect for the New York Park Department.

He reported that the trouble with the Boston elms was due entirely to carelessness of the park employees and general ill treatment, and none were dying from natural causes. The importance of a "tree doctor" for "The Hub" and other cities is thus forcibly indicated.

**NEWARK'S EFFICIENT EXCISE BOARD.**—It is fairly well known that the city of Newark, N. J., is one of the most orderly of cities. At least figures would confirm that statement, and the citizens of the city ascribe the decrease in drunkenness and disorder that has taken place during the last few years to the efficiency of the Excise Board. This is a bi-partisan board and it has made the saloon-keepers independent of machine politics and makes it possible for respectable men to engage in the liquor business without obtaining influence and tying themselves up to the political leaders. The Board is composed of two Democrats and two Republicans, and each commissioner receives \$1,000 a year. There are three license inspectors and the expenses of the Board amount to \$7,000 a year. There are about 1,400 saloons in Newark and each pays a license fee of \$250 yearly. No person whose character is not good can secure a license under any circumstance. Only American citizens are given licenses and every applicant must have been a resident of the city for at least one year. The police are largely relied on to ascertain the character of the applicants and the police captains and the chief have formed the habit of attending the weekly meetings of the Board and thus become acquainted with the character of every new saloon-keeper. The inspectors search out the applicant's reputation also and for a week the name, address and location of the prospective saloon are advertised in the newspapers and persons are requested to appear before the Board and give their views. No saloons are allowed within 200 feet of any church, school or hospital. In case it is proposed to revoke a license, the offender is given a chance to defend himself, the city's law department taking charge of the trial. The mayor appoints the commissioners for terms of two years each.

**NORFOLK'S WATER SUPPLY.**—To have an abundant, pure water supply is what every city in the land is striving after, but many have not reached the goal. Norfolk, Va., is an exception to this rule, if we may judge from the last report of the water department. The filter plant has been in operation but two years, yet the results are such that "no outlay made by the department has been more satisfactory to the consumer—in fact, it may be classed as the most valuable and important improvement that has ever been made to the works." This should and can be said of every city's water supply if the proper filters are installed. The report shows that there was an average of but 138 bacteria per cubic centimetre and these did not include the coli communis. The double trolley system has caused much electrolysis in the water pipes and the report recommends that the double system of trolley be instituted. A pump with a capacity of ten million gallons per day is to be erected this year. The average daily pumpage was 5,307,912 gallons. The water committee of the council endorsed the report of City Engineer Brooke, recommending a universal meter system as the best and most economical way of reducing the wastage. At present there are 204 meters in use. A careful house to house inspection reduced the waste of water from defective plumbing, but a meter system would absolutely prevent all waste of any kind. The average number of filters used daily was fifteen and there was filtered a total of 1,871,093,840 gallons. This was 94.3 per cent. of all the water supplied to the city. The coagulating basin was cleaned three times at intervals of four months and the sand beds sterilized with soda ash and steam three times at intervals of three months. The water receipts amounted to \$121,581.05, the operating expenses \$11,360, and other expenses \$161,864.31, and there was a balance on hand at the end of the year of \$17,704.28.





## TO TAX OR NOT TO TAX FRANCHISES

A DETERMINED fight is being made at Omaha, Neb., to have the franchised corporations of the city assessed for taxation in proportion with assessments on other classes of property. It is the policy of the tax department of Omaha to assess all real and personal property at 40 per cent. of its actual cash value, but the five public service corporations of the city have always escaped with a much lower percentage. This year, Tax Commisisoner William Fleming, assessed the companies what he considered to be 40 per cent. of their true cash value, his assessments of the five companies aggregating more than \$5,000,000, but the Board of Review cut this sum down to about \$1,800,000. Finally the assessments came before the City Council, sitting as a board of equalization, and here the Omaha Real Estate Exchange began its fight to have the assessments raised to a figure that would be in proportion to the assessed valuations put on real estate. The Real Estate Exchange was prepared to furnish proofs showing the actual cash value of the corporation properties and showing that were the assessments put at 40 per cent. the aggregate of the five assessments would be in the neighborhood of \$4,800,000. The Council set a time for the presentation of this evidence for its consideration. On a recent Saturday, by a vote of five to four, the Board decided to hear the case of the Real Estate Exchange on the following Monday afternoon. But by Monday morning the corporation interests had secured another member to its side, and the resolution to hear the evidence showing the value of the corporation properties was stricken from the minutes of the Board by a vote of five to four, and by the same vote the Board took adjournment *sine die*. Then the Real Estate Exchange went into the Supreme Court and asked for a writ of mandamus to compel the Council to reconvene as a board of equalization and to hear the evidence concerning the true value of the corporation properties. Council for the Exchange asked for the appointment of a referee to hear the facts in the case and to report whether or not the Council should reconvene as a board of equalization. The city attorney, assisted by counsel for the interested corporations, opposed the appointment of a referee on the ground that the board of equalization had already given sufficient consideration to the assessments involved, had adjudicated all questions properly coming before it and had adjourned. The Supreme Court, however, granted the application for the referee, and that officer of the court will ascertain whether or not there is any reason to reconvene the Council as a board of equalization. All the evidence gathered by the Real Estate Exchange, to show the actual value of the corporation properties, will be produced before the referee. Meanwhile, the district court has enjoined the Council from making the 1902 tax levy on the basis of the present assessment—and the city will have to worry along without any revenue until this fight is settled by the Supreme Court. The report of the Referee must be ready by April 15.

## RATTLER TESTS FOR PAVING BRICK

THE National Brick Manufacturers' Association has issued a partial report of its committee on technical investigation, giving the rattler tests for paving brick. The tests are briefly as follows:

I. DIMENSIONS OF THE MACHINE.—The standard machine shall be twenty-eight inches in diameter and twenty inches in length, measured inside the rattling chamber.

II. CONSTRUCTION OF THE MACHINE.—The barrel may be driven by trunnions at one or both ends, or by rollers underneath, but in no case shall a shaft pass through the rattler chamber. The cross-section of the barrel shall be a regular polygon having fourteen sides. The heads shall be of gray cast-iron, not chilled nor case-hardened. The staves shall preferably be composed of steel plates with cast-iron peans which ultimately break under the wearing action on the inside. There shall be a space of one-fourth of an inch between the staves for the escape of the dust and small pieces of waste.

III. THE COMPOSITION OF THE CHARGE.—All tests must be executed on charges containing but one make of paving material at a time. The charge shall be composed of the brick to be tested and iron abrasive material. The brick charge shall consist of that number of whole bricks or blocks whose combined volume most nearly

amounts to 1,000 cubic inches, or 8 per cent. of the cubic contents of the rattling chamber. (Nine, ten or eleven are the number required for the ordinary sizes on the market.) The abrasive charge shall consist of 300 pounds of shot made of ordinary machinery cast iron. This shot shall be of two sizes, as described below, and the shot charge shall be composed of one-fourth (75 pounds) of the larger size and three-fourths (225 pounds) of the smaller size.

IV. SIZE OF THE SHOT.—The larger size shall weigh about seven and one-half pounds and be about two and one-half inches square and four and one-half inches long, with slight rounded edges. The smaller size shall be one and one-half inch cubes, weighing about seven-eighths of a pound each, with square corners and edges. The individual shot shall be replaced by new ones when they have lost one-tenth of their original weight.

V. REVOLUTIONS OF THE CHARGE.—The number of revolutions of the Standard test shall be 1,800, and the speed of rotation shall not fall below twenty-eight nor exceed thirty per minute. The belt power shall be sufficient to rotate the rattler at the same speed whether charged or empty.

VI. CONDITION OF THE CHARGE.—The bricks composing a charge shall be thoroughly dried before making the test.

VII. THE CALCULATION OF THE RESULT.—The loss shall be calculated in percentages of the weight of the dry brick composing the charge, and no results shall be considered as official unless it is the average of two distinct and complete tests, made on separate charges of brick.

The committee expects to prepare a complete report of all the tests, etc. In this connection it is well to consider the standard rattler test recommended by the American Society of Municipal Improvements referred to on page 195 of Volume XI. of the MUNICIPAL JOURNAL AND ENGINEER, which correspond closely with the tests recommended above.

## GAS LIGHTING IN CANADA

WHILE electric lighting is on the increase in Canada the use of gas as an illuminant is tending to decrease, it being crowded aside by the more modern light. The number of gas works in Canada, according to the returns of 1895, was 49. In 1901 there were only 43, according to the inspector's returns. In 1901, Deseronto had gas works which it does not seem to have had in 1895. Lindsay and New Westminster had gas works in 1895 and none in 1901. The standard of gas is 16 candles. Taking the 29 gas works in Ontario in 1901, the average, as given by the Government inspector, for twelve inspections a year, is 18.80 candles; so that the gas light of Ontario cities and towns is well beyond the standard. The average of the three cities of the province of Quebec whose gas lights are given in the inspector's reports is 17.87; Montreal and Quebec being 18.92 candle power and 18.00 candle power respectively, Sherbrooke bringing down the general average, because its special monthly average is only 16.45 candles. For some cause the average of 1901 is below that of 1895. For instance, the gas used in Ontario in 1895 had an average of 19.36 candles, and that used in the same province in 1901 had a power equal to 18.80 candles, a diminished power equal to about 3 per cent. To put it in another form, in 1895 there were 17 cities and towns with gas above 20 candles. In 1901 there were only nine. The same fact is observable in most of the other provinces. In Montreal, the average of 1895 was 20.43 candles, and that of 1901 was 18.92. Of all the cities and towns of Canada, Woodstock, Ont., had the best gas, the average of twelve monthly testings being 22.74 candles. Sherbrooke, which in 1895 was supplied with a 23.06 candle gas, sunk to a 16.45 candle gas in 1901. Kingston in 1895 had a gas of equal power to that of Sherbrooke, 23.06 candles, but was last year reduced to a 21.09 candle gas. Ottawa had in 1895 a gas which gave a light equal to 22½ candles. In 1901, its gas had a power equal to 21.74, just about three-quarters of a candle less. Some cities have had better gas light in 1901 than in 1895, though this is contrary to the general experience. Toronto, for instance, had a gas in 1895 which averaged for the dozen testings of the year 19.42 candle power, and in 1901 it had gas of 20.16 candle power.—*Canadian Engineer*.

## A SUCCESSFUL MUNICIPAL WATER WORKS PLANT

We are greatly indebted to Mr. Edmund Mather, President of the Board of Water and Light Commissioners of the city of Harrisburg, Pa., for a copy of the annual report. It shows that the year had been a very successful one and the water works on a firm foundation. The cash receipts from water rent amounted to \$108,446.09, from furrows \$1,311.79 and from profits on meters \$725.65, making a total of \$110,483.53 which was placed in the treasury. On the other hand the operating expenses, including improvements, betterments and improvements at Reservoir Park were \$31,439.84, and this left a balance for the payment of interest on bonds. State tax on loans and for the general and sinking funds, of \$79,043.69. The improvement at Reservoir Park should rightly be deducted from this amount as not dealing directly with the expenses of running the works and this would then leave the net operating expenses at \$25,715.55. While the operating expenses and improvements for 1901 were only \$9,394.98 over these for 1888, the receipts for 1901 surpassed those for 1888 by \$41,284.73. The pumpage for the year 1901 amounted to 3,290,960,300 gallons, an increase of 771,012,670 over that of 1888 and of over \$200,000,000 gallons over the previous year, 1900. This large amount of water was due to the large number of manufactories, including both the increased business of the old and the addition of the new ones. The city has grown greatly during the last year and this tended to account for a large portion of the increased consumption. At first glance this per capita consumption of 153 gallons per day seems entirely too large and smacks of waste, but Mr. Mather calls attention to the fact that there are few cities that use so much water for manufacturing as does Harrisburg. Therefore it is entirely unfair

to charge all this water to the per capita of the entire city. It is estimated that only eighty-three of the 153 gallons is used for domestic purposes, the rest being devoted to the use of elevators, motors, fountains, flushing sewers, fire, manufacturing and similar purposes.

There is an ordinance in the city that provides for a rebate to water users on the assessments for laying street mains. This aids in removing objections to the laying of mains in regions of the city but sparsely built up, and enables the department to make extensions for connecting dead ends and thus gives better circulation, better

fire supply and encourages the building of suburban homes.

The turbidity of the water is tested every day at noon according to the method of Mr. Allen Hazen and shows the condition of the water before it is pumped into the reservoir where it has the opportunity of settling before passing into the mains. The only remedy from the pollution that is present is the establishing of a filtration plant and this is recommended by the Water Board.

For twenty-seven years the engines have pumped water for an average of eighteen hours and twenty-three minutes daily, and while a few minor repairs have been made from time to time, the record is one rarely found.

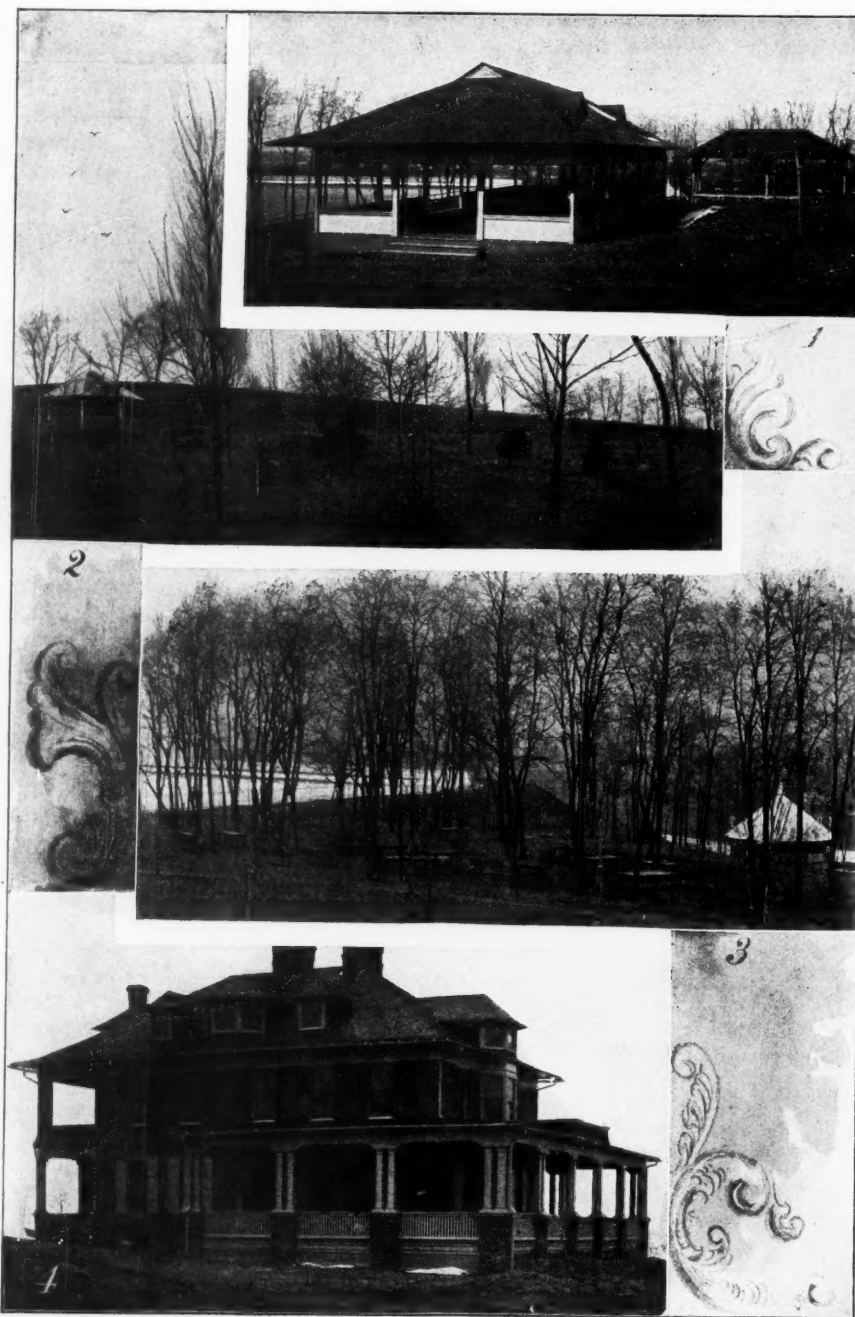
There are now in the city 4,603 meters in service, fifty-five of them being owned by the city and meter water for manufactories and the railroads. The rest are owned by private consumers who pay all repairs on them. During the past year only 258 meters needed repairing and the cost of repairing and keeping these meters in order was only \$251.75, of less than 1 per cent. of their value. Nearly every house erected during the year was supplied with a meter. About 65 per cent. of all the service taps are metered and the rate for water by this means of measurement is low.

An instance may be cited to show how carefully the department watches to prevent all waste of water as well as to care for the public property. There are eleven drinking fountains in the city and these are regularly inspected and kept in good order and every Friday the bowls are emptied and scrubbed out with a brush. During the winter the bowls and urns are removed to the shop to be cleaned, painted and stored.

The total earnings for the water department for 1901 aggregated \$162,868.58, the gross earning being \$103,953.74 and,

deducting the credit allowed on water pipe assessment, free water and water rent due, the net cash earnings were \$51,573.69. The net indebtedness up to January 1, 1902, was \$477,145.11. The total cost of maintaining the pumping station for the last year, exclusive of a few small minor expenses, was \$18,458.06, and it has been estimated that for every pound of coal burned 377.09 gallons of water were pumped.

Bound with the report of the Water and Light Board, is the twelfth annual report of the Reservoir Park Commission. This park, named from the presence of a reservoir in its midst, has natural



SCENES IN RESERVOIR PARK, HARRISBURG, PA.



advantages that render it a delightful spot for a public recreation ground. So popular has this park become that the Commissioners are asking that a large part of the adjacent grounds about the park be purchased and the limits of the park extended. Great care has been taken of this park and everything done to make it pleasant for the populace. The grass has been kept in good condition and well watered and manured, trees and shrubbery have been set out, tennis courts made and the whole place made very attractive.

As is the custom the public are invited to subscribe towards a fund

to provide free concerts during the summer. The press greatly assisted in this work and the railroads provided free transportation for bands from neighboring cities. Lights were furnished free by the Harrisburg Electric Company and the Chief of Police detailed men for duty in the park.

The expenses for the park maintenance amounted to \$2,437.02, including all salaries and repairs. So liberally did the public respond to the call for money to carry on the free concerts that all expenses were paid and a balance of nearly \$300 left for the coming summer.

### COVINGTON'S NEW CITY HALL

MUNICIPAL officials are wiser in this day and generation than were their predecessors of the past. In no phase of the work is this made more apparent than in connection with the construction of public buildings. The city of Covington, Ky., has recently completed a city building, of which the accompanying illustrations give a comparatively good idea of its exterior and of the first floor plan. There is nothing particularly novel about it, but it was built with an attempt to adapt it to the needs of the city's business. It was designed by Messrs. Dittoe and Wisenall, of Cincinnati, and erected under their personal supervision.

Mayor W. A. Johnson, in writing to the MUNICIPAL JOURNAL AND ENGINEER, describes the building as follows: "The design of the exterior may be called transitional Gothic, executed in brick and stone, with a very massive treatment, the decorative feature being the principal entrance, which is elaborately carved and is considered a masterpiece of Gothic sculpture.

"The interior treatment is simple in design, the main staircase being executed in wrought iron and bronze, the light effects being softened by handsome stained glass windows of appropriate designs.

"The mosaic floors, handsomely decorated walls and ceilings add richness to the general effect, and the interior furnishing of metal and quartered oak, with rich carpetings, altogether, make a pleasing and harmonious interior, suggesting comfort, practicability and convenience at every hand.

"The building is built around an open court in the center, and the plan is admirably adapted for light and ventilation, with the offices arranged on the four sides and all corridors, toilet rooms and staircase halls overlooking the interior court. It is 160 feet long on Court avenue by 120 feet deep along Third street, is about 80 feet high,

containing in all 1,320,854 cubic feet, and was erected at a total cost of \$200,000, including all furnishings.



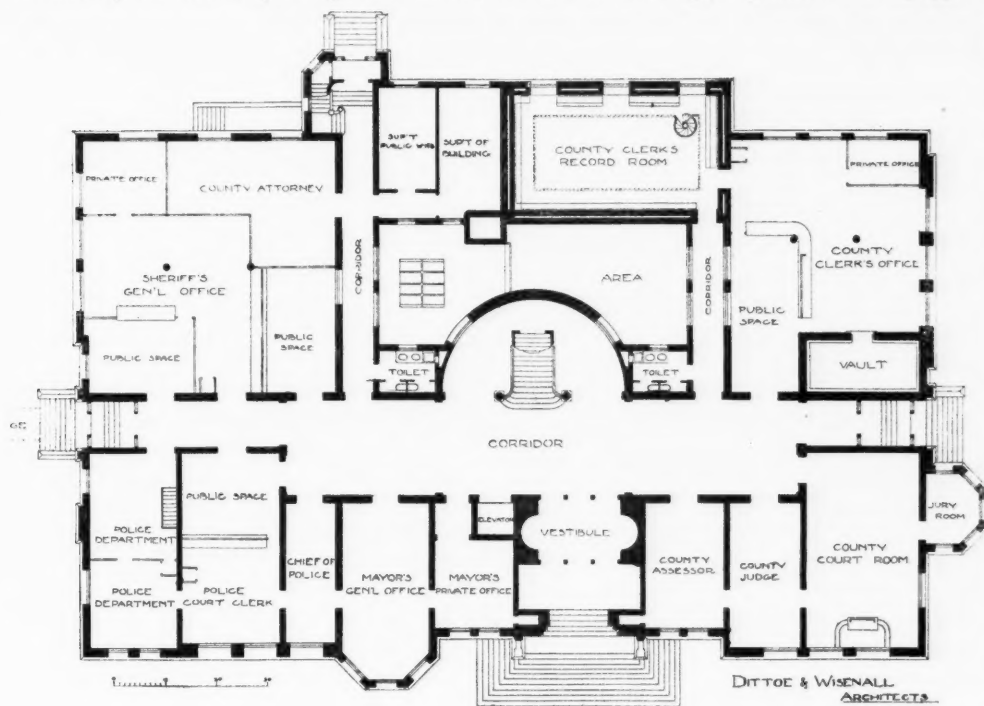
COVINGTON'S NEW CITY HALL

"Ample record rooms and vaults have been provided for the safe-keeping of all court, county and city records and thoroughly fire-proofed, and equipped with the latest metallic filing devices. The floors of these rooms, as well as all corridors and public rooms, are tiled with vitreous tile mosaic tiling in handsome designs, the city seal and other emblems being ceramic mosaic.

"The interior furniture is entirely of metal, the latest method of public building furniture being employed and the filing devices being of the most approved and practicable known to science.

"The City Hall is connected with the jail building by means of an underground passage, and ample accommodations for the police department have been arranged in connection therewith.

"The third floor is occupied by the circuit court room, jury and witness rooms, grand jury room, circuit judge, circuit clerk's, master commissioner's, and commonwealth attorney's offices. The second floor is occupied by the council chamber and committee rooms, city clerk treasurer, delinquent tax collector, auditor, law library, city solicitor, city attorney and license inspector, city engineer, city assessor, board meeting room and board of education. The first floor is occupied by the offices of county clerk, county judge, county attorney, county assessor, sheriff and mayor's office and police department."



FIRST FLOOR PLAN OF THE NEW CITY HALL

# ELECTRIC LIGHTING STATISTICS FOR EIGHTY-EIGHT AMERICAN CITIES

Including Those Having a Population of from 12,000 to 200,000, Given in Order of Population

Place.	Population.	Arc system, arcs capacity.	Incandescent sys-tem, lamps ca-pacity.	No. public arcs.	Hours per year lighted.	Price, arc. Public per year. Commercial, per month.	Price, incandescent. Public per year. Commercial, per month.	Power used.	Cost fuel Boiler per ton.
Stillwater, Minn.	12,318	80a	1,700	16	3,373	\$87.50	(4) \$14.00	Wood	
Saratoga Springs, N. Y.	12,409	250b	2,250	98	4,000	98.00	23.00	\$4.00	
Glens Falls, N. Y.	12,613	270b	4,000	160	4,000			4.00	
Ashland, Wis.	13,074	130a	4,100	34	4,000	A. N. 108.00	\$ 5.75	kw-h .15	1.50
Plymouth, Pa.	13,649	160b		60	4,000	75.00	6.00		1.50
Beverly, Mass.	13,884	280a	2,650	175	A. N.	109.50	\$ .40	(1) 1.17	4.00
Streator, Ill.	14,079	400b	1,300	93	A. N.	90.00	7.00	kw-h .15	1.00
Cheyenne, Wyo.	14,087	160b	3,800	41	A. N.	135.80	10.00	kw-h .14	
Alton, Ill.	14,210	180b	10,000	125	†	90.00	a 5.30	kw-h .10	.80
Manistee, Mich.	14,260	290b	6,000	105	†	70.00	5.00	(1) .25	2.25
Steubenville, O.	14,349	270b	1,500	196	4,000	75.00	5.25	kw-h .12	.75
Newburyport, Mass.	14,478	270a	2,100	157	1,800	73.50	6.00	kw-h .20	3.25
Middletown, N. Y.	14,522	125a	6,000	61	A. N.	71.60	kw-h .13	(2) 15.00	3.00
Jacksonville, Ill.	15,087		1,500				8.50	kw-h .14	1.50
Sedalia, Mo.	15,231	100b	2,000	180	4,000	83.95	9.00	(1) .50	1.25
Rome, N. Y.	15,343	300b	7,500	79	†	\$ 66.00	\$ 6.00	kw-h .15	2.60
Atchison, Kan.	15,722	205b	4,400				7.00	kw-h .165	1.90
Stamford, Conn.	15,997	300a	500	d 556	4,000		\$ 6.00	kw-h .200	3.25
Lorain, O.	16,028	135b	3,000	67	2,221	77.95	3.50	kw-h .10	1.30
Marietta, Wis.	16,195	130	4,000	60	\$ †	66.00		kw-h .15	2.75
Danville, Ill.	16,354	350b	10,000	216	2,000	30.00	5.00	kw-h .15	1.00
Lockport, N. Y.	16,581	275b	700	256	4,000	78.00	6.67	kw-h .10	2.40
Moline, Ill.	17,248	550b	24,000	390	3,800	72.00	6.00	kw-h .10	2.40
Norwich, Conn.	17,251	250a	7,500	184	A. N.	90.00	By met's	kw-h .15	3.00
Belleville, Ill.	17,484	160b	2,400	150	2,170	62.50		(1) .65	.75
Stockton, Cal.	17,506	320b	6,000	176	†	106.80		(1) 1.80	3.50
San Diego, Cal.	17,700	400b	1,500	141	2,200	120.00	10.00	(1) .80	8.85
Lafayette, Ind.	18,116	375a	4,500	285	2,200	66.00	5.00	(1) \$ .40	2.30
Richmond, Ind.	18,226	300b	1,500	186	A. N.	90.00	9.50	(1) \$ .50	2.35
Galesburg, Ill.	18,607	350b	5,000				7.00	kw-h .20	1.12
Burlington, Vt.	18,640	400b	10,000	192	4,000	80.00	5.50	kw-h .12	
Green Bay, Wis.	18,684	200b, 175a	5,000	118	† A. N.	75.00	7.00	(1) .50	2.35
Madison, Wis.	19,104	247a	10,000	138	3,987	80.00	\$ 8.00	kw-h .13	4.25
Sandusky, O.	19,664	285	7,000	165	4,000	87.50	7.00	kw-h .10	2.00
New Albany, Ind.	20,628	100b	1,000				4.00	(1) .35	1.75
Waco, Tex.	20,680	255b	8,900	150	A. N.	120.00	10.00	am-h .01 1/4	3.20
Leavenworth, Kan.	20,735	245b	3,250	90	A. N.	90.00	\$ 7.00	(1) \$ .80	2.20
Decatur, Ill.	20,754	120b	6,500				\$ 8.00	(1) \$ .80	.90
Wilmington, N. C.	20,976	150	4,650	75	†	108.00		(1)    .25	2.00
Mount Vernon, N. Y.	21,228	200b, 260a	16,300	93b, 312a	4,000	kw-h .20	kw-h .20	kw-h .20	3.25
San Jose, Cal.	21,500	300b	3,000	140	†	84.00	9.00	kw-h .15	7.85, 4.
Oswego, N. Y.	22,199	250b	21,000		A. N.	71.00	5.00	kw-h .10	3.25
Clinton, Ia.	22,698	400b	3,000	103	3,200	90.00	8.00	kw-h .20	1.25
Springfield, Mo.	23,267	250b	2,300	152		77.50	\$ 8.00	(1) \$ .80	2.00
Bloomington, Ill.	23,286	100b	4,000				6.00	(1) .50	1.90
Waltham, Mass.	23,481	295a	3,950	147	2,389	83.95	\$ 9.00	(4) 19.20	4.35
Nashua, N. H.	23,898	400a	4,000	225	4,000	112.00	6.00	(2) 32.00	5.05
Hamilton, O.	23,914	35b	3,000				\$ 5.00	kw-h .07	2.15
z Hamilton, O.		300b	4,800	212	4,300	75.00	5.00	kw-h .07	2.20
Aurora, Ill.	24,147	185b	7,000				4.00	kw-h .08	1.50
North Adams, Mass.	24,200	175a, 175b	8,000	180	4,000	88.50	\$ .23	kw-h .15	3.80
Meriden, Conn.	24,296	150a, 25b	2,800	192	3,300	110.00	a 5.00	kw-h .125	4.50
Kingston, N. Y.	24,535	200a	5,000	122	4,000	85.00	\$ .25	(1) 1.00	3.00
Wichita, Kan.	24,671	200b	10,000				\$ 8.00	(1) \$ 1.50	2.00
Council Bluffs, Ia.	25,802	235b	2,250				7.00	kw-h .15	2.35
Fort Worth, Tex.	26,688	165b	10,000				a 6.00	(1) .75	2.50
La Crosse, Wis.	28,895	300b	7,400	217	2,600	85.00	kw-h .10	kw-h .13	3.50
Montgomery, Ala.	30,346	60b, 360a	8,000	51b, 185a	A. N.	b 88.00	a 87.50	(1) 9.00	2.30
Superior, Wis.	31,091	385b	8,000	160	4,000	80.00	\$ 7.50	(1) .60	2.50
Fitchburg, Mass.	31,537	470a	4,000	280	4,000	100.00	7.50	kw-h .20	5.00
Sioux City, Ia.	33,111	270b	6,800	90	2,500	75.00	\$ 10.00	(1) 15.00	2.25
Newton, Mass.	33,587	300a	11,600	219	4,000	100.00		(4) 17.50	4.35
Chelsea, Mass.	34,072	350a	4,000	223	3,700		9.00	kw-h .18	4.00
Davenport, Ia.	35,254	700b	7,000	426	A. N.	85.00	7.00	(1) .75	1.65
Quincy, Ill.	36,252	360b	20,000	360	†	60.00	kw-h .15	kw-h .15	1.50
Mobile, Ala.	36,469	100a, 400b	10,000	200	4,000	88.00	13.00	(1) .75	3.10
Augusta, Ga.	39,441	820b	32,000	330	4,000	70.00	6.00	(1) .85	3.45
Lincoln, Neb.	40,169	275b	7,000	190	† A. N.	120.00	10.00	am-h .01	2.15
Lancaster, Pa.	41,459	80b	18,500				\$ 4.50	kw-h .08	2.60
Youngstown, O.	44,885	100a, 500b	6,000	365	3,987	64.00	3.00	kw-h .12	1.40
Holyoke, Mass.	45,712	275a, 260b	3,000	275	4,000	a100.00	b 6.00	kw-h .25	4.10
San Antonio, Tex.	53,321	650b	19,000	325	3,200	90.00	8.00	kw-h .20	1.60
Salt Lake City, U.	53,531			415	A. N.	72.00	9.00	kw-h .15	
Charleston, S. C.	55,807	250a	4,950	113	4,000		11.00	kw-h .15	3.70
Peoria, Ill.	56,100	550b	2,000	547	3,800	65.00		kw-h .10	1.55
Utica, N. Y.	56,383	30a, 150b					\$ † .30	(2) † .05	1.75
Evansville, Ind.	59,007	455b	8,000	265	4,000	60.00	5.00	(1) .65	.82
Troy, N. Y.	60,651	100a, 800b	13,000	415	A. N.	129.57	\$ 12.00	kw-h .16	2.40
Des Moines, Ia.	62,139	250b	6,000				7.50	kw-h .07	1.15
New Bedford, Mass.	62,442	788b	26,307	208	3,280	† .38	8.00	(1) 22.26	2.25
Lawrence, Mass.	62,559	530a, 510b	16,000	b 105	4,000	b 90.00	7.50	A. N. 24.00	4.00
Oakland, Cal.	66,960	1,200b	25,000	785	2,800	106.40	8.65	kw-h .06	7.00
Lynn, Mass.	68,513	400a, 825b	18,000	b 287		b 110.96	b 6.50	(4) 18.50	
Trenton, N. J.	73,307	500b	25,000	325	4,000	98.50	7.00	lamp .17	3.35
Seattle, Wash.	80,671	200b	2,500				12.00	(1) 1.50	2.25
Paterson, N. J.	105,171	450a, 1100b	43,000	b007, 137a	4,000	126.00	a 10.00	(4) 16.00	2.50
St. Paul, Miss.	163,065	100a, 920b	8,400	407	4,000	90.00	b 12.50	(1) \$ 1.75	4.00
Louisville, Ky.	204,731	1,850b		1,530	4,000	84.00	\$ † .30	kw-h .14	1.30

† Per night. † Lighted by moon scale. || To 10 P. M. \$ To 12 M. S Steam. W Water. G Gas. z Municipal. a 1,200 candle-power. b 2,000 candle-power. d Number of consumers. lp-h Lamp-hour. A. N. All night. (1) 16 c. p. (2) 32 c. p. (3) 50 c. p. (4) 25 c. p. am-h Ampere-hour. kw-h Kilowatt-hour. † Wood per cord. (From Brown Directory of American Gas Companies. By courtesy of the publisher.)



## THE OLD-FASHIONED DEPARTMENT AT ST. PETERSBURG

Queer Apparatus Used—Primitive Alarm Service—Has a Drill School—Great Loss from Fire

By Our Special Correspondent

THE fire department of St. Petersburg, Russia, is a mixture of the old and the new. While the chief, Colonel Kirilloff, is a fine commander, is assisted by efficient officers and has a force of brave and hard-working men at his command, the department is way behind the times as viewed from the American standpoint. The methods as well as the apparatus are those of three decades past. A hopeful sign for the future advancement of the department, however, is the fact that the authorities at St. Petersburg know that they are not up-to-date, that the department is too small and old-fashioned, and a committee is now at work to decide what changes are necessary and what improvements are to be introduced. The fire companies are to be increased and reorganized and modern engines purchased.

The population of St. Petersburg is placed at 1,003,313 and the city covers a large area of ground on both sides of the Neva river. While nearly all buildings within the city's limits are of brick or stone—only in the suburbs are wooden buildings allowed—the city is so thickly populated that the present force is not adequate for the requirements. The chief has at his disposal 1,027 men, 384 horses and seventy-four pieces of apparatus. Besides the 1,000 ordinary firemen, there are fourteen company commanders, nine clerks and three surgeons. The chief is called the "Brandt-major."

### QUEER APPARATUS USED

To the American or Englishman, the apparatus in use in this Russian city is, in many cases, remarkably strange and queer. There are wagonettes to carry the men, casks of water on wheels, pumps, carts to carry automatic and hand ladders. There are three steam fire engines in the service, but, as will be seen from the accompanying illustration, they are not like the American machines. The city is distributed much in the manner of American cities, a company being assigned to each of the fourteen districts. In reserve are held four companies with others, two to serve the Winter Palace and royal residences. In winter the large amount of snow and ice that is always present renders it necessary to equip all the apparatus with runners.

The arrangement of response to alarms is rather peculiar. Whenever a fire occurs in a district, the company of that district turns out as well as that in the adjoining district should the fire be located nearer the latter than the former company. In case of a fire outside the districts five companies turn out with two engines and if a large one, ten companies with three or four engines take charge of it. The water supply is obtained from the general city water mains and, while the quantity is very large, the pressure would not seem to be very great to judge from the streams that the firemen are playing on

the ruins in the illustration. To supplement the water from the mains is the supply that can be obtained from the river and canals that cross and recross the city in all directions.

As in Germany, a prompt and careful inquiry is made into the cause of every fire that occurs and all cases that smack of incendiarism are placed in the hands of the public prosecutor. A sojourn in Siberia awaits the guilty party.

The firemen in St. Petersburg are dressed much after the European style for this service. They wear helmets of brass, double-breasted coats reaching to the knees with brass buttons and boots. The

officers' uniforms are of dark blue, but the men are dressed in gray, with a broad, black leather belt, having a socket for an axe, and shoulder straps.

### HOW ALARMS ARE GIVEN

The efficient services of the Gamewell fire alarm telegraph are not used by the St. Petersburg department to notify them of the existence of a fire. Instead a fireman is stationed at all times in the tower of the city hall and he keeps an eye on the surrounding city to catch the first glimpse of a fire. When a fire is noticed, in the day he runs up black balls on the outside of the tower as signals, in the night red lanterns are used. The number of the balls or lanterns shows the district in which the fire is located. As may be imagined this method of sending in an alarm is not productive of a speedy arrival of the firemen at a fire. Twenty minutes to half an hour is good time unless the fire occurs near an engine company.

Even a slight fire always throws the neighboring inhabitants into the greatest confusion and they proceed to strip their houses of their contents at once. In one illustration may be seen the wagons filled with household effects. As the police do not attempt to establish any fire

lines, the streets are crowded and the firemen greatly hindered in their work. The cooperation between the police and the firemen is one of the things that must be established before the authorities of the city can hope to make any department successful. The procedure of an engine to a fire is usually attended by lots of noise. A man sits by the side of the driver and swings a big bell over his head to warn people that other vehicles are coming. Besides the engine, five vehicles follow in succession. One carries a hose pipe and another a barrel and all are filled with the firemen.

### THE DRILL SCHOOL

A picture is shown of the drill school where the St. Petersburg firemen learn to handle fires and keep in practice. The water tower is shown at the right of the picture and in the centre a fireman sliding down the safety slide that takes the place of the jumping nets in



CHIEF KIRILLOFF OF ST. PETERSBURG, AND ONE OF HIS FIRE ENGINES



ST. PETERSBURG FIREMEN IN SERVICE—SHOWING SMALL STREAMS USED

America. One end of the material of the slide is fastened to the window sill, the men hold the lower end and the persons jump in and slide to the bottom in safety. What would happen, if the flames should burst out of the lower window, it is hard to say. It is possible that the slide would have to be replaced with a new one.

Last year Russia suffered greatly from fire. Many districts were almost wiped out by the flames. Before the rains in September, the entire city was enveloped in smoke from burning peat beds and previous to that time, towns, villages, lumber yards and factories were burning continuously. The peasants are the principal sufferers and they seem utterly incapable of resisting the fire. No amount of loss seems to teach them better methods of building their houses and they go on in the same old way, putting up their thatched roofs and wooden buildings all huddled together. A fire in a peat bed does not seem to arouse them and it is only when a village is threatened do they attempt to extinguish it. During the last century Russia lost at least \$15,000,000,000 by fire and the loss per year is averaged at \$150,000,000. As the houses of the peasants at least are not of much value, judging from our standpoint, these figures would seem to be rather large, but are given by Prince Mestehersky. At any rate it behooves the authorities in the cities at least to hasten to establish better fire service on a modern basis.

**TO PENSION FIREMEN.**—Mayor Hayes, of Baltimore, Md., is in favor of pensioning all firemen just as the police are pensioned. The firemen take great risks in the discharge of their duties and if they are hurt or disabled in the service, or if they serve a long time they should receive a pension of sufficient amount to enable them to live comfortably.

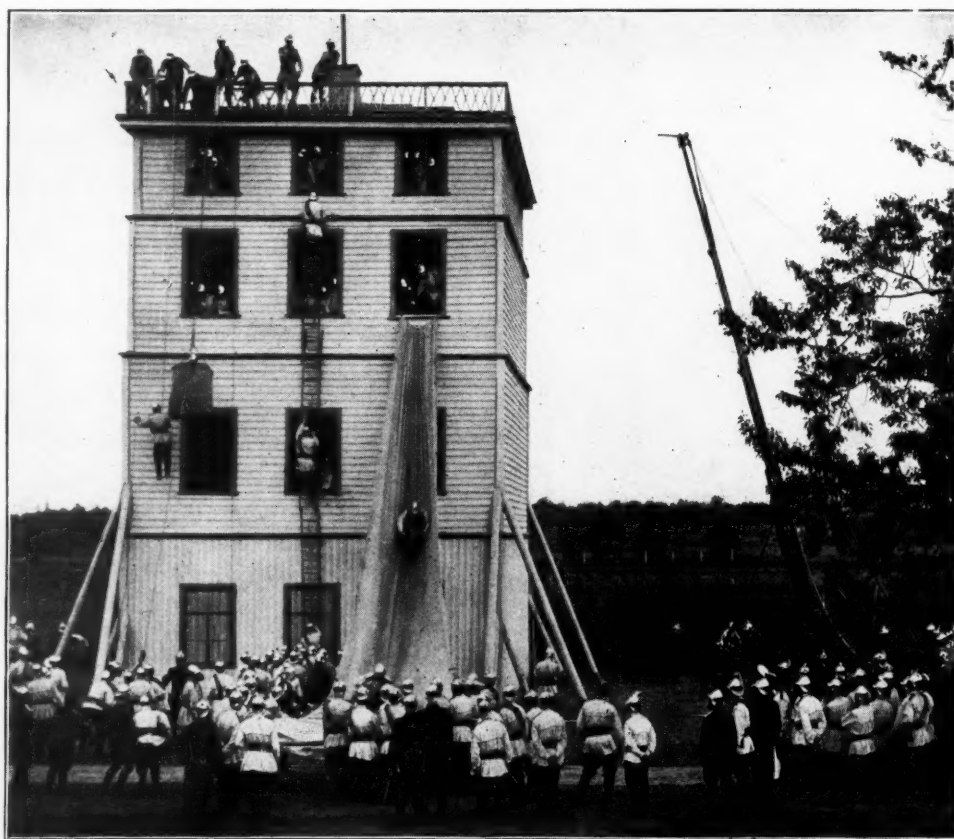
## SAVING LIFE AT FIRES

By August Partz

SINCE the late calamitous conflagration on Market Street, at which so many persons frightfully perished, people have at last become conscious of the real character of the so called fire escapes, which are defacing so many buildings. It almost sounds like cruel irony to call those things "escapes." In the majority of cases they appear to be fit only for adding horror to disaster, serving as gridirons to roasting human beings. Not enough that the steps are invariably so short and steep as to make it quite impossible for a number of men and women to descend them in a flight for life without rushing and tumbling; the absurd structures are also commonly placed right across windows, so that the flames issuing therefrom easily reach their vainly-for-help-crying victims.

Various ideas have been published regarding precautionary measures for the rescue of persons caught in buildings on fire, the most feasible of which appear to be those relating to the partitioning of large floors and the erection of fire-proof shafts. There can be no doubt

that such shafts, if extending from cellar to roof, open at both ends, provided with easily descendible stairs and double iron doors at each floor, and kept lighted during work hours would be efficient safeguards against loss of life. But this is one of those improvements which require much time for their introduction; it may indeed be considered as relating mainly to buildings which are yet to be, leaving it an open question what to do about the many unsafe factories, stores, and other buildings that now exist, and particularly those the



DRILL OF ST. PETERSBURG FIREMEN



situation or conditions of which are such as to debar the erection of fire-proof shafts.

Now and then we hear of persons having saved themselves by climbing to the roofs of buildings on fire and thence proceeding to roofs nearby; and it seems strange that no special attention has been given to such a rational mode of escaping and no suitable means have been provided to enable men and women employed in the shops or stores quickly to ascend to the roofs at the occurrence of fire and then get onto the roofs of neighboring buildings. Yet, those means are quite simple and of moderate cost; though they will require the enactment and proper enforcement of stringent laws, to prevent their being neglected, which is too often the case with precautionary measures.

In addition to the partitioning of all large floors by walls capable of resisting at least for a while the spread of flames, let there be two or more independent flights of stairs, extending to the roof and always to be kept unobstructed; and at the head of the stairs let there be trap-doors fastened in such a manner that they can easily be thrown open. That will generally give the people inside a fair chance to reach the roof before there is any danger of its giving way, and they may forthwith continue their flight where an adjacent roof is nearly on a level with the one in which they are. But the latter may be con-

of escape from death or torture than anything else. But, alas, most improvements for the safety of life come in the trail of disasters, which they might have prevented if made in due time. That with a well-made apparatus and trained nerves there is no extraordinary risk in parachuting (analogous to the word ballooning) has oftentimes been demonstrated by safe descensions even from great heights, and inventors will no doubt be ready to supply any safety devices that may yet be deemed desirable for diving into air.—*City and State*, Philadelphia.

### FIRE AND POLICE PERSONALS

—Dunmore, Pa., has elected J. T. O'Neill chief of the fire department.

—Chief F. J. Murphy of the fire department of Utica, N. Y., has resigned. He has held his position since May, 1899.

—At the annual election of the fire department at Waco, Tex., Chief Prescott was re-elected. This makes the fifteenth time that he received the honor.

—Chief Godfrey Kubach of the fire department of Bay City, Mich., has tendered his resignation. His successor will be chosen at the next meeting of the Council.

—Major Edward Hughes, Chief of the Louisville, Ky., Fire Department, has reached his seventy-fourth year. For twenty-seven years he has been in the paid department and its chief since 1881.

—Ex-Chief Hugh Bonner of the New York Fire Department sailed from New York for Manila on February 22. He will take charge of the fire department at that city and will reorganize and equip it with modern apparatus.

—Fire Commissioner B. F. Harrington, of Providence, R. I., was presented with a magnificent loving cup by his friends on Washington's birthday in token of their esteem. Mr. Harrington was recently captain of Hose Company 11.

—William Sullivan has been elected Chief of the fire department of New Britain, Conn., in place of John W. Carlton, resigned. Chief Sullivan was assistant chief and is fifty-eight years of age. He has been thirty-seven years in the department.

—Mayor Willard, of Chelsea, Mass., has removed William P. Drury from the office of Chief of Police. The Mayor alleges that he took this action because the Chief did not prove capable of keeping the city free from gambling and illegal selling of liquor.

—Chief of the Fire Department of Denver, Col., John Redell, was dismissed from the department after being found guilty on charges of brutality to his men and serious charges made by citizens. The defense called no witnesses to rebut the testimony of the prosecution.

—Chief Coots of the fire department at Indianapolis, Ind., has been much worked up over the net work of wires that practically cover three of the streets. Should a fire start in any of the buildings an immense amount of time would be lost in clearing away all the wires as no truck or ladders could operate in the network. The danger the hremen would run amid these wires can only be guessed at from experience at fires where high tension wires were encountered.

—Chief of Police Pfister, of Racine, Wis., has started out to clear his city of saloons harboring disorderly persons. He has asked that the licenses of several saloonkeepers be revoked. He has been collecting evidence against these places and it is likely that the Council will grant his requests.

—After a year of good work in the Police Department of Dayton, Ohio, Chief Whitaker has been reappointed by the Police Commissioners. When appointed last March, the Chief was entirely new to police work and so was given a salary of but \$1,800 a year. This has been raised to \$2,500 in recognition of his efficient service.

—The vacancy caused by the death of George W. Van Hise, Chief



SCENE AT A ST. PETERSBURG FIRE—SHOWING WATER SUPPLY TANKS

siderably higher or lower than any close by, and to provide for cases of this kind, let iron stairs or slanting ladders be permanently attached to the bare walls that extend above the roofs of the next, and conditionally also of some neighboring buildings. It will readily be seen how by those means, and maybe with a final assistance by firemen or neighbors, the escapes may be safely completed. The same system, modified so as to suit local conditions, may fitly be applied to hotels, theatres, lecture halls, tenements, asylums, etc.

Dwellers in those extremely elevated modern edifices, poetically called sky-scrapers, which continue to multiply, might do well to think in time of parachutes and then see to it that enough of them be on hand for a possible emergency. Though they should never be used, their presence would at least have the quieting effect of a nerve tonic. It may be asked, What other saving medium is there in sight, on which reliance could be placed at a moment of urgent need? Elevators might be of some limited avail; but their killing capacity is fearful, rivaling that of our "fire-escapes." Far better to trust one's life to a substantial old-fashioned umbrella with a looped leather strap fastened to its handle. As the safe use of a parachute depends on a certain skill and confidence, these should first be acquired by practising in a progressive way, and to that end the dwellers on high might advantageously form themselves into parachute clubs, in order to pursue a course of stimulating companionable training and make sure of being well prepared if suddenly confronted by a fateful dilemma. Unless there be a flaw in the logic of events, those parachutes are bound to come and to stay, for they give more satisfactory promise

of the Police Department of Greater Rensselaer, N. Y., has been filled by the appointment of Mr. James Hutchinson to the position. Chief Hutchinson was formerly the proprietor of a café in the city. Chief Van Hise died of pneumonia after an illness of but three days. He was a veteran of the War of the Rebellion and joined the police force of the then village thirty years ago.

—The charges against Chief of Police William A. Taylor, of Anaconda, Mont., have been investigated by the police committee of the Council and were dismissed as having no foundation. The Chief was accused of failing to arrest persons accused of violating the law in regard to disorderly houses. When the trial of the Chief was held, the accusing alderman did not appear and, after hearing the witnesses for the defense, the charges were dismissed.

—The strict enforcement of an ordinance of Jersey City, N. J., nearly resulted in the suppression of a Sunday school. This school is held in a hall that is connected with a saloon and the law forbids

any playing of musical instruments or singing in rooms adjoining barrooms. Captain Archibald McCraig, of the Fourth Precinct, threatened to arrest the superintendent of the school. Services were held, however, and the threat did not materialize, the captain evidently being willing to overlook the violation of the law and save himself from unpleasant notoriety.

—Two veteran deputy chiefs of the Fire Department of Brooklyn, N. Y., were summoned to appear before the Board of Surgeons of the Fire Department for examination to determine their fitness to continue in discharge of their duties. This is usually taken to mean that they are to be retired and new men appointed. Deputy Chief James Dale is one of these men and Deputy Chief J. H. Perry is the other. Chief Dale has been a member of the department since its organization in 1869 and has held his present position since 1894. Chief Perry entered the department in 1889 and was appointed chief in 1892. Both men are over sixty years old.

## FIRE AND POLICE ITEMS

**TO TEACH POLICE THE LAW.**—The police force of Montreal, Canada, will soon be in position to conduct a case in court provided they study hard enough. Chief Legault has succeeded in having a portion of the police appropriations set aside for the purpose of hiring an instructor who will deliver lectures to the members of the force once a week on both civil and criminal law as it concerns their duties.

**GAS "CUT-OFF" SUGGESTED.**—At the suggestion of Chief Foley of Milwaukee, Wis., the board of public works will endeavor to have the common council pass an ordinance compelling all consumers of gas to place a "cut-off" valve in the sidewalk in front of their buildings, that in case of fires the firemen can cut off the gas supply from the building, thus preventing explosions and the danger of overcoming the men should a gas pipe break.

**PENSIONS FOR POLICE.**—The city of Spokane, Wash., is to pension all members of the police force who are injured or disabled while in discharge of their duties, or have served twenty years. One-half their regular pay will be allowed them during life and good behavior. When any of these officers or men that are on pension are, in the opinion of the chief, able to perform any public duty they shall be so employed and receive full pay for such.

**LOCKED OUT JUDGE.**—Chief Kain, of the Saginaw, Wis., police force, on orders from Mayor Baum, locked the doors of the court over which Judge O. F. Deveau usually presided. Judge Deveau had been charged with misfeasance in office and this was the measure taken by the Mayor, on advice of the city attorney, to prevent the Judge from holding court. To render the court room safe against the judge, the Chief put new locks and bolts on all the doors.

**POLICE MUST ENFORCE THE ANTI-SPLITTING LAW.**—Chief of Police Wittman, of San Francisco, Cal., has issued a general order to the force calling upon the men to enforce the ordinance against spitting on the sidewalks. Arrests are to be made of all disobeying the ordinance. A delegation of ladies from the California Club called on the chief and brought to his attention the fact that the ordinance was not being enforced by the police and their visit resulted in the foregoing order.

**POLICE TO INSPECT GARBAGE.**—Mayor Mulvihill, of Bridgeport, Conn., is in favor of having each officer inspect the receptacles for garbage on his beat. This would obviate the necessity and save the expense of having special officers for this work and, in addition, the police could do the work more thoroughly than any one man. The extra duty would not take up much of the officer's time and householders would pay more attention to a uniformed officer than to any inspector from the health department.

**POLICE WANT MORE PAY.**—The police of Akron, O., are endeavoring to get the police of Youngstown to join with them in a

movement that will place the police of both cities on the same basis as regards pay. At present the Akron men receive much less than those in Youngstown. A bill is to be presented to the Legislature which provides that the pay of the police chief shall not be less than \$1,500 a year; a captain not less than \$1,200; all patrolmen \$780 to \$800 for the first year, \$800 to \$850 for the second and \$850 to \$950 for the third.

**CITY IN A DANGEROUS CONDITION.**—New Orleans, La., is again in the midst of press agitation concerning better fire protection for the city. The city stretches along the river for thirteen miles and includes in its limits areas of swamp and sparsely settled districts. In the midst of the business section is a district filled with wooden buildings and in the section there is not a fire hydrant and most of the streets are unpaved. Should a fire gain headway in this district it is probable that it would extend to the surrounding more valuable property.

**FIRE APPARATUS AND CITY RECORDS DESTROYED.**—A recent fire destroyed the city building of Decatur, Ind., and its contents were entirely destroyed. The building was a frame structure and the fire had gained such headway before it was discovered that the fire apparatus, kept in the building, could not be gotten out in time and this, together with the city records, went up in smoke. The necessity of placing the records of a city in fireproof vaults was thus brought home to the residents of this city as it has been emphasized to the citizens of cities and larger places.

**TO INSURE FIREMEN.**—Instead of granting the request of the firemen for an increase of pay, the Fire and Water Committee of the Hamilton, Ont., Council recommends that each man be insured for the sum of \$1,000 to be paid in case of death, including that by suffocation. Two-thirds of the amount will be payable in the event of permanent injury and proportionate sums for loss of limb or sight, but no weekly indemnity will be paid for injured men. The age limit of applicants has been placed at from twenty-one to twenty-six years and all firemen reporting sick shall be examined by the medical health officer, but not treated by him.

**WANT FEES AS WITNESSES.**—The police officers of Spokane, Wash., will test the law that was passed by the last Legislature, prohibiting any employee of the State, county or municipality, from drawing any fee for testifying for such State, county or municipality, in any matter connected with their duties, except that fees and mileage shall be paid if the officer goes out of his own county to testify. Whenever any officer now appears as a witness in court he is careful to have his appearance duly recorded by the clerk so that, should the test case be decided against the law, the officer will have an official record of his services as witness, and will be able to collect back fees.

**YOUNG LADY ORGANIZES FIRE COMPANY.**—Miss Jennie Wilkins, of Albion Place, N. J., originated and alone organized a



fire company. She gave a party at her home one evening recently, and invited every young man of the place to attend. When the time arrived for the speeding of her guests she called the young men aside, unfolded her plans, and soon the company was organized. The twenty young men who signed the rolls will be known as the Alerts, and the school bell will call them out when their services are needed. Miss Wilkins, who is secretary of the company, has secured money enough to purchase buckets, and she has announced a euchre party to be held in the near future. The proceeds will be used in purchasing a hose reel.

**IMPROVEMENTS AT DES MOINES.**—Some important improvements have been made in the fire service of Des Moines, Ia., during the past year. The largest expenditure was that of \$7,000 for installing the Gamewell electric fire alarm system including a switchboard at the central station. Two new stations have been equipped. Four years ago civil service was instituted in the department and during that time there have been no dismissals from the service and the force has increased in efficiency. The salaries of the men will be raised to \$1,000 each per year and a fund will be started for firemen who have served twenty years and have outlived their usefulness.

**POLICE CHIEFS CONVENE.**—The Association of the Chiefs of Police of the Pacific Slope was duly organized on March 5th at San Francisco, Cal., at a meeting called by Chief Wittman of that city of the chiefs of police of cities west of the Rockies. Chief Wittman was nominated and elected President of the organization, Chief Elton of Los Angeles, Vice-President, and Chief Hodgkins of Oakland, Secretary and Treasurer. A Board of Directors was appointed to serve one year and those elected to this Board for the coming year were Chiefs Kidward of San Jose, Sullivan of Sacramento, Morgan of Fresno, Reynolds of Butte, Mont., and Rawle of Santa Cruz. The Association will meet at Portland, Ore., next September.

**ALL RECORDS BROKEN.**—During 1901 the work in the fire department at Richmond, Va., has been phenomenal. The fires have been most serious, yet no fire extended beyond its place of origin. There were 436 alarms during the year, an increase of 25 per cent. over 1900. Nine times the general alarm was sent out, bringing out the whole department. The total loss for the year was \$1,011,758, but this large sum was due mainly to the fact that the alarms were not turned in until the flames had gained great headway. The department is sadly in need of apparatus and there is also need that the whole department be made regular. Two new engine companies, a hook and ladder company and a water tower are needed to make property reasonably safe.

**MAY BAR MEN FROM THE FORCE.**—The police of Duluth, Minn., have made the startling discovery that the civil service rules of the department require that candidates for the force must be five feet ten inches in height and weigh at least 160 pounds. According to these rules only nineteen out of the forty-two men now on the force would be eligible. The matter of weight could be easily met, as may be imagined, but height is not so readily obtained. Another bar to holding positions on the force is cigarette smoking. There is a clause in the civil service rules stating that any of the mentioned disqualifications are good cause for the removal of any man after his appointment and this little clause is causing lots of the men now in the department to lose sleep.

**LARGE FEBRUARY FIRES.**—The month of February has seen some of the largest fires that have occurred in many years. On the second of the month the city of Waterbury, Conn., sustained a loss of over \$2,000,000, but the area burnt was confined to a small portion of the city. In this fire none of the municipal buildings suffered. Not so the fire at Paterson, N. J. Here the city hall, a comparatively new building, was entirely destroyed, as well as the public library, and the officials were compelled to make their headquarters in the courthouse. The city hall cost, when new, \$165,000 and it is probable that a new building will be erected very soon. The Paterson

fire was not one, but several, the sparks from the original blaze starting the others. Norfolk, Va., had a large fire, in which several hotels were destroyed.

**NOVEL METHOD OF FIRE FIGHTING.**—The ingenuity of the residents of Georgetown, Pa., has been proved on more than one occasion, but their latest exhibition of this quality was shown at a recent fire. This fire broke out in a section of the town remote from the main portion and the heavy snow prevented the other residents from reaching the place quickly. The section is inhabited by Poles and other foreigners and they stood helplessly by while their houses took fire. Some of the native residents saw that something had to be done quickly to prevent the rest of the buildings from taking fire, so they marshalled the foreigners and started them throwing snow-balls at the flames wherever they started on any house. Chopping a hole through the roof of a house, they had snow brought to them and from that point pelted the small flames with snow-balls.

**BINGHAMTON'S FIRE DEPARTMENT.**—In submitting his report for the last year, Chief Hogg, of the Binghamton, N. Y., Fire Department, has made some recommendations that will be of interest to firemen. Chief Hogg calls attention to the fact that there is no free approach to the river by means of which engines could be stationed at the bank and use river water should the water supply of the city give out. He recommends that the matter of fire cisterns be investigated and some of them be installed in certain sections. The addition of combination wagons to the service is regarded by the Chief as of great importance inasmuch as experience has shown that the loss on small fires, where it was necessary to use water because of the lack of chemical engines, would have equipped yearly every company with a combination wagon. During the past year there were 106 alarms of fire and the total loss for the year was \$79,257, a decrease of over \$100,000 over the preceding year. There are in the department seventeen paid men, four call men and 528 volunteers.

**POLICE AND FIREMEN TO RIDE ON PASSES.**—The trolley company of Albany, N. Y., has all along firmly refused to allow policemen and firemen to ride on its cars free, and the city authorities have not been able to get it to rescind its action. The traction company also operates the street cars of Troy and the rule against free rides applies there also. Mayor Conway, of Troy, however, determined to issue passes to all the policemen and firemen, and if the company refused to accept them, the city would bring damage suits against the company under the law that gives this right of free rides to all employees of the city government. Subsequent events showed that the company was not willing to accept the passes and a policeman and fireman who presented the same to a conductor were required to pay fare or get off the car. These men were sent by Mayor Gaus, of Albany, to test the constitutionality of the law. It is likely that the conductor of the car or an official of the company will be arrested and thus bring the matter to trial. The officials of Troy will await the outcome of the suit.

**THREE-PLATOON SYSTEM IN NEW YORK.**—By a vote of nearly three to one the Assembly of New York State has refused to consider the bill establishing the three-platoon police system in the Greater City. This system was introduced into the department last year shortly before the election in November, but the new Police Commissioner, Col. John N. Partridge, abolished it shortly after taking charge of the department. He investigated the system and concluded that the plan was ineffective, dangerous and costly. He considered that eight hours was too long for any officer to do steady duty and there would be a strong tendency to shirk during the last hours. He calculated that it would cost \$2,500,000 more annually to keep up the new system as it would be necessary to appoint men so that there would be on call and on duty a sufficient number of officers to keep order in the city. On occasion of the accident in the subway, it took thirty precincts to supply 285 men and eighty-nine of these had to be taken from their posts.

**GOOD WORK AT SPOKANE.**—Some interesting figures are given in the report of Chief A. H. Myers, of the Spokane, Wash., fire department. To begin with, the total expenditures for the department footed up \$71,507.09 and this will be reduced during 1902 to \$69,584. There were 230 alarms during the year, of which twenty-three were false, forty-six came from the alarm boxes and 106 by telegraph. The total loss on buildings and contents amounted to \$84,188, being on property valued at \$536,105. There are six stations in the department and the possessions are valued at over \$50,000. There are two hose wagons, three combination hose and chemical wagons, two chemicals, two third-class "Silsby" engines, one second-class of the same make, one first-class "Metropolitan," two hook and ladder trucks, one supply wagon, a hose reel, two buggies for the chief, 11,700 feet of hose and thirty horses. The department has now sixty-three paid men, including the chief, assistant chief and secretary, the electrician, six captains, three foremen, three engineers, twelve drivers, three stokers, twenty pipemen and twelve truckmen.

### SAFE-GUARDING PUBLIC HEALTH

**OLD CLOTHES DISEASE SPREADERS.**—Dr. Bissell, Bacteriologist in the health department of Buffalo, N. Y., has been conducting many experiments with a view of determining the per cent. of the spread of disease through second-hand clothing stores. Both Dr. Bissell and ex-Health Officer Wende have been working on plans for the establishment of a disinfecting station.

**SPITTING NOT ALLOWED.**—The city of New Haven, Conn., will enforce the rule against spitting on the sidewalks or in public places. The Elm City is following the lead of Bridgeport, in which the enforcement of an ordinance of expectorating on the sidewalks has made the streets seem 50 per cent. cleaner. Youngstown, O., will soon have an ordinance against spitting in cars, and the police of Birmingham, Ala., will enforce an old ordinance against promiscuous spitting on the walks of that city.

**CHICAGO THE MOST HEALTHY CITY.**—The report of the bureaus of vital statistics of various states have started the press making comparisons of the death rates of their several cities with others in the country. With a death rate of only 13.8 per thousand, Chicago claims to be the most healthy city of its approximate size in the world. Milwaukee's rate is lower still, being 13.01, but the city is but one-sixth the size of the "Windy City." Pulmonary tuberculosis was the most frequent cause of death, while in Chicago pneumonia caused twice as many deaths as any disease. The rate in New York was 17.2, Boston's 20.3 and Philadelphia's 18.4.

**MUST REPORT CONSUMPTIVE CASES.**—Physicians and health boards are fast coming to recognize that consumptives should no more be allowed to go at large than those suffering from small-pox and other well-known contagious diseases. The various ordinances prohibiting spitting in public places and cars are the entering wedges which will result in time in the isolation of all consumptive patients. The state of Connecticut has come to recognize the contagious characters of pulmonary tuberculosis and a law has just been passed requiring that all cases of this kind must be reported by the attending physician within twenty-four hours of its recognition.

**DISINFECTING PLANT WANTED.**—President Helfer of the Jersey City, N. J., Board of Health, has devised a plan whereby he hopes to put a stop to the spread of small-pox. It is his idea to have a disinfecting plant, built by the city, to which all furniture from houses containing the disease may be taken and thoroughly disinfected. It has been found that, after premises have been fumigated, other cases would break out. The plant would cost about \$1,500 and would include apparatus for generating formaldehyd gas and other disinfecting material and would be far more effective than a portable apparatus. When the furniture was removed from a room, the room could be more easily disinfected.

**DISINFECTION SUPPLANTS VACCINATION.**—Cleveland, O., has a health officer that has succeeded in defeating small-pox

where others failed. When Dr. Martin Friedrich was appointed health officer, he stopped at once the vaccination crusade and started a house to house disinfection by his sanitary officers. Shops, factories and schools were fumigated with formaldehyd, garbage heaps were burned and a strict quarantine of all persons exposed to the disease was established. The effect was immediately noticeable, for while the city for over two years had not been without from ten to 100 cases constantly, in a very short time there was not a patient left in the hospitals. Dr. Friedrich is not an anti-vaccinationist, but will not use any vaccine that has come from a cow kept in a stable. He says that all vaccine points should be tested and stamped pure. Small-pox germs will not thrive in dirt and, to prevent the spread of the disease, disinfection is the thing.

**A SANITARY BARBER SHOP.**—There has been established in the Union Station in Indianapolis, Ind., a modern sanitary barber shop, in which every precaution is taken to guard the patrons against disease, the danger of which keeps many men from patronizing tonsorial parlors. The proprietor has installed a nickel-plated sterilizing oven in which are kept aseptic towels and other trade articles. The razors are sterilized after each using by dipping in alcohol and formaldehyd and being placed in the oven. The barbers wash their hands with castile soap and dry them on sterile towels immediately before waiting on a new customer. Shaving brushes are cleaned in hot water, soaked in alcohol and formaldehyd, and again washed. A new piece of soap is used for each customer and the mug is scalded and disinfected each time it is used. The hair brushes have metal backs and are cleaned like the shaving brushes. Clean linen covers are placed on the chairs twice a day and sterile towels are placed under the head of each customer. Rules similar to those that obtain in this shop should be enforced by every city in the Union.

### "VACCINATION CREED"

THE Board of Health of the city of Chicago has circulated the following bearing the above title:

We, the undersigned, hereby publicly profess our firm belief—based upon positive knowledge, gained through years of personal experience and study of small-pox and vaccination—

1 That true Vaccination—repeated until it no longer "takes"—always prevents small-pox. *Nothing else does.*

2 That true Vaccination—that is, vaccination properly done on a clean arm with pure lymph and kept perfectly clean and unbroken afterward—never did and never will make a serious sore.

3. That such a Vaccination leaves a characteristic scar, unlike that from any other cause, which is recognizable during life and is the only conclusive evidence of a successful vaccination.

4. That untoward results never follow such Vaccination; on the other hand, thousands of lives are annually sacrificed through its neglect—a neglect begotten of want of knowledge.

This supplement of practical results in Chicago was added to the foregoing "creed."

Not one of the 346 cases of small-pox discovered in Chicago within the last three years was found vaccinated as defined in the "vaccination creed."

Of the total number, 306 never had been vaccinated at all, though most of them claimed that they had. Examination of the arms proved that these attempts at vaccination were failures; there was no scar, and the patients finally admitted that the vaccinations when performed did not "take." A "failure" is not a vaccination; therefore, these 306 cases had never been vaccinated.

Of the remaining 40 cases, 26 had old, irregular and doubtful scars, said to be the result of vaccination, but these were not characteristic; they were more like the scars from infected sores or wounds than those from vaccine. Nine had fair old scars of vaccinations made from 30 to 40 years previously. Only 5 had typical (characteristic) scars; but these also were the results of vaccination made many years before and never repeated.

In no single case of the 346 had the terms of the first article of the "vaccination creed" been complied with—vaccination had not been repeated until it would no longer "take." If it had been they could not have contracted small-pox.



## CURRENT LITERATURE ON MUNICIPAL TOPICS

### Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs— Municipal Reports Received

THE large majority of the books dealing with the municipal field are devoted severally to one or, perhaps two, main topics under that head. In *Municipal Engineering and Sanitation*, Mr. M. N. Baker has covered the entire field and thus enables the student of municipal improvements to take in the whole situation at a glance, weighing each department in its relative proportion to the others. Of course it is impossible, in the space allotted to this work, to do more than present the main features of each subdivision, such as sewers, water works, lighting, etc., but the author gives the general practice, the underlying principles, a few details to support his statements and points out the mistakes in practice where they exist. In many instances the author will not be supported by many students of municipal problems, but opinions differ and facts can be brought forward to prove either side of the question. It might be suggested that, in revising this work, more details of actual practice be given and a few drawings be added to illustrate the proper construction of municipal accessories mentioned in the text.

While but general statements can be made on any one subject, even professional men will find many practical hints in this book especially on topics that are new to all. References are given to standard works on the several topics discussed so that the reader may go into detail if he so desires. "The City and Its Needs" forms the introductory chapter and outlines the defects, needs and possibilities of the modern city. The author divides his work into five portions devoted to "Ways and Means of Communication" giving chapters on pavements, subways, transportation between city and country, bridges and ferries, telegraph, etc. "Municipal Supplies" treats of water, its distribution, purification and consumption, ice, pure milk supply, markets, office buildings for the city, and light, heat and power. "Collection and Disposal of Wastes" embraces sewerage and sewage disposal, the care of streets, disposal of garbage and refuse, and cemeteries and crematories. The fourth portion of the book is devoted to the "Protection of Life, Health and Property" and these comprise fire protection, building and plumbing regulations, smoke abatement, prevention of water pollution, public baths, lodging houses, parks and playgrounds. "Administration, Finance and Public Policy" is the general head of the last division. Under this will be found chapters on city charters, departments of public works, boards of health, municipal franchises and contracts, municipal ownership, the annexation of smaller with larger places, the alternate, but better, method of municipal coöperation, uniform accounting, and taxation and assessments. Published by the MacMillan Company, New York. Price, cloth, 12mo., 325 pages, \$1.25 net.

In his preliminary report on the *Roads and Road-Building Materials of Georgia*, S. W. McCallie goes into detail in showing up the conditions that exist in the State relative to the making of good roads and the facilities that are at hand for such work. He gives a brief history of road construction with a description of the different kinds of roads, and then goes on to show how the value of good roads cannot be overestimated. There are many illustrations showing the construction of roads and drains, and to these are added half-tone plates giving scenes on typical roads of the State. He explains the different character of road material and those that are found in his State, and the kinds of road machines and their uses. The typography of Georgia as it relates to the highways is the subject of a chapter, and a map is appended showing the disposition of the trap dikes. The equipment, methods of road-working and materials of Georgia are then taken up by counties, giving the principal statistics under these heads. Mr. McCallie is assistant geologist of the State, and this report is known as Bulletin 8, published by the Geological Survey of Georgia, located at Atlanta.

THERE is a bulletin issued by the United States Department of Agriculture that should be in the hands of every school committee in the country. *Tree Planting on Rural School Grounds*, while primarily intended for the country districts, is also applicable to town schools and those in small cities. In the country, however, school grounds are usually unimproved and the money spent in the school building is often handicapped in its purpose because trees are not planted about the building to protect it and make the lives of the teachers and scholars comfortable. In the winter coal is saved by having the school surrounded by a goodly grove of trees.

Aside from the material good that trees render to a school, their educational value as nature studies are not to be ignored. This bulletin tells what trees to plant, how to plant them and how to get the most good out of them. The care of trees is also taken up. Another feature of importance is the portion on "Studies for the Teacher and School," to which is added facts about trees, giving many interesting and instructive points as to their food, growth, influence on them of surroundings, etc. A request to the Secretary of Agriculture at Washington, D. C., will bring a copy of this pamphlet to any address.

### PERIODICALS

IN the Proceedings of the American Society of Civil Engineers for February will be found *A Brief History of Road Conditions and Legislation in California* by Marsden Mason. The article is nearly 10,000 words in length and takes up conditions of climate, vegetation, occurrence of road-building materials, legal conditions and legislation dealing with roads. New York, N. Y.

*Drainage of Swamps for Watershed Improvement* by Edward S. Larned of the Metropolitan Water Works, Massachusetts, shows the work that has been done to rid the watersheds of the stagnant water of swamps. The ditching work was very successful and cheap. There are several illustrations showing the results obtained and the construction of the ditches. *Journal of the New England Water Works Association*, Boston, Mass., March, 1902. Issued quarterly. Price \$3 a year; \$1 a number.

*Bolton's Sanitary Crusade* is the leading article in *The Municipal Journal* for February 21, 1902. It is a description of the sewage works and the sludge pressers. The issue of February 28 has the story of the *London Telephones* to be operated by the Post Office. London, England. Price per week 1d.

THE supplement to the *Surveyor* for February 21, 1902, has an article on the *Municipal Work in Shanghai*, describing the isolation hospital for the Chinese. London, Eng. Price per week 3d.

IN *Insurance Engineering* for February, 1902, is an article by Charles L. Norton, on *Portland Cement as a Protection From Fire* in which the author tells of experiments made to show the relative efficiency of different materials in greater or less thickness when subjected to fire. New York, N. Y. Price \$3 a year; 25 cents a number.

*Aggregation of Humanity in Cities*, by H. M. Wiltse appeared in the *American Law Review*. St. Louis, Mo., February, 1902.

THE *New East River Bridge, New York City*, by F. W. Skinner. *Munsey's Magazine*. New York, N. Y., February, 1902. Price per year \$1; 10 cents a number.

*Municipal Art Crusade in Belgium*, by C. M. Robinson. *Harper's Magazine*, New York, N. Y. February, 1902. Price per year \$4; 35 cents an issue.

*Municipal Labor Exchange in Copenhagen*, by V. Holmes. *Social Science*, January, 1902. New York, N. Y.

IN *The Sanitarian* for February, 1902, R. S. Guernsey continues his articles on *The Utilitarian Principles of Taxation and Their Relation to Altruism* in which he takes up taxation for local improvements and appropriation of franchise taxes. Brooklyn, N. Y. Price \$4 a year; 35 cents a copy.

EDWIN BURRITT SMITH contributes an article of some 4,500 words to the *Atlantic Monthly* for March, 1902, on *Municipal Government: Council and Mayor*. He says that, in framing the successful scheme of government for the nation, the fathers of American democracy overlooked the growing municipalities, but this was doubtless due to the fact that large cities did not then exist. As the cities grew, however, makeshifts were used to meet the numerous wants, "thus the government of every American city has become a huge conglomeration of warring officials and boards representing the state." Inasmuch as the people have been too busy with their own affairs, the entire matter of municipal government has been left to politicians and diverted from public to private ends. "The state, in attempting to govern the city, has unduly emphasized the executive view of municipal administration. The power to legislate is the distinguishing mark of self-government. . . . To be really self-governing, the people of a city must enjoy the right to create a body having power to legislate for them in all matters of local concern." The author says that the mayor assumes the role of a temporary dictator and is beyond the control of the city. "The council of a city, which exists as the creature of the state, is at best an unnecessary, and at the worst, a contemptible thing." The author holds that, as the national government is separated from the state, so the state should allow self-government in the cities. The institution of this independence of the city would not involve the loss of state authority in the city. All powers that do not concern the state or the nation should be relegated to the cities. The people of the state cannot know the needs of the cities like their inhabitants do. Thus the people of a city should be permitted to frame a charter for themselves, to determine all questions of municipal public policy, and to have the power to legislate as well as administer. "When this independence is secured, ours will be really a government of the people." Under the caption, *A Roman Warning*, Charles E. Bennett tells of the reforms that Sextus Julius Frostinus introduced into the water department of Rome during the first century of the Christian era; how this sturdy conscientious old Roman made the city cleaner, the air purer and removed the causes of pestilence that had formerly given the city a bad name. Boston, Mass. Price \$4 a year; 35 cents a copy.

The December, 1901, issue of *Municipal Affairs* contains six articles on the subject of "Sunday Opening of Saloons" in New York. The first is the *Saloon Problem* in New York by John G. Agar; "Raines Law Hotels" or state promoted vice is contributed by John DeWitt Warner; *Enforce the Law* by M. N. Clement; *Local Option by Popular Vote* by Lyman Abbott; *Sunday Opening by Statute* by William Travers Jerome; and *Social Function of the Saloon* by Felix Adler. Other articles on municipal topics are *City Administration in Sweden* by Gustaf Siosteen; *Municipal Government in the Philippines* by Carl C. Plehn; *Minneapolis Plan of Direct Primaries* by William C. Hodder; *Public Art—the Test of Greatness* by Brooks Adams, and *Abolition of Grade Crossings* by Charles Zueblin. New York, N. Y. Issued quarterly. Price per year \$2.00; 50 cents a copy.

THE *Journal of Acetylene Gas Lighting* for February 15th, 1902, contains a short article by John B. C. Kershaw, descriptive of the *Chevres Power Station, Switzerland*. This station was erected under the control of the municipality of Geneva and supplies that city. The average charge per year per horse-power is about \$15. London, Eng. Price 6d per copy.

*Excise Taxation in Porto Rico* is the subject of a 7,000 word article by J. H. Hollander in the *Quarterly Journal of Economics* for February, 1902. It is a description of the system of excise taxation levied for the benefit of the insular treasury and in lieu of the internal

revenue taxes. The author was a special commissioner sent by the Secretary of War to revise the laws relating to taxation in the island and is thoroughly familiar with the subject and his views on the changes were adopted by the Secretary and were instrumental in preventing the system of revenue taxes of the United States being reproduced in Porto Rico. The author first takes up the excise taxation under the Spanish regime and then goes on to tell in detail how the excise taxes were introduced, what difficulties were met and how they were overcome. The problems that presented themselves were two: "The first was legislative and involved the determination of the objects to be taxed and the rates to be imposed. The second was administrative, and concerned the methods of collecting and enforcing the taxes when imposed." The inhabitants of the island did not take kindly to the taxes and considerable difficulty was experienced by the officials in preventing fraud. However, "the qualitative effects of the new system have been no less distinctly successful than its quantitative results. . . . It seems entirely reasonable to state that the system has injured no industry, has curtailed no production, has burdened no consumer, and that its enforcement has been efficient and its acceptance general." Boston, Mass. Price per year \$3; per copy \$1.

IN *McClure's Magazine* for March will be found a sketch of the career of Denis Mulvihill, the "stoker-mayor" of Bridgeport, Conn. The author of this sketch, Maurice Sherman Porter, has brought out the traits of character to which is due the fact that the people of the park city chose a stoker to be their chief magistrate. Though a stoker in one of the large factories in Bridgeport, perseverance and thrift enabled Denis Mulvihill to save money and invest in land. When the Democrats of his district were without a candidate for alderman, Mulvihill was suggested, was nominated and elected. As one of the city fathers his economy would not brook the wastefulness of the people's money that he saw going on all about him and he began to object and to ask questions about every proposition to spend money. This did not suit the party leaders of either party, but he would not be ruled by any party ties. "Old rugged honesty" they began to call him. When notified that he had been nominated for mayor, he repeated the oftspoken sentence that he had used through all his aldermanic career, "We must have prudence and economy in our affairs and no junketing trips." When the votes were counted, Denis Mulvihill was elected by a majority of 3,385. People of both parties, including six Republican ex-mayors, had championed his cause. New York, N. Y. Price per year \$1; per copy 10 cents.

IN the March issue of *Public Health* appears an article on the *Plague: Its Exclusion and Control*, by D. S. Davies, M. D., Medical Officer of Health of Bristol, England. The author takes up the matter of the duties of authorities to arrest the infected persons, of the destruction of rats from infected ships and tells of the regulations in force at the English ports. Dr. W. H. Symons, Medical Officer of Health of Bath, discusses the *Distribution of Phthisis* as he had met with it in his work in Bath. He gives tables showing how the different cities of Europe and America compare with one another in this respect. London, Eng. Price per copy, 3d.

*Civic Cleanliness* is the subject of a short but strong article by Albert L. Berry, in *The Commonwealth* for March. He says: "No city can be beautiful until it is first clean." The first step towards civic cleanliness is the observance of municipal ordinances and, if people support them when made, they can do more towards keeping the city clean than in any other way. No ordinance has any weight unless it has behind it public opinion. "We do not require new laws but we need men who will obey the law that we now have; obey them by desire and not by compulsion." Mr. Frederick N. Cruden, Librarian of St. Louis Public Library, contributes an article of 3,500 words on *The School and the Library*. He points out how the old idea that story-books were a distraction for school children has given way to the modern idea that stories are of the greatest benefit to a child in enabling him to retain facts and incidents much more than text-books can do. St. Louis, Mo. Price \$1 per year; 10 cents a copy.



## THE MODERN GARBAGE AND CONTRACTOR'S WAGON

"The Best Wagon Possible"—Liberalily Guaranteed—Save Money for Those Who Use Them  
—Phenomenal Increase in Business

THE demand for a special wagon which may be adapted to the various needs of a city is rapidly increasing because public sentiment insists that city housekeeping shall be performed in a more thorough way than has been the custom in the past. The ingenious Yankee, as a consequence, has been at work upon the problem, and produced any number of wagons which are adaptable to the many conditions found in the modern city. A representative of the MUNICIPAL JOURNAL AND ENGINEER recently visited the Watson Wagon Company



GRADING WAGON

at Canastota, N. Y. While there he was shown through the works by Mr. A. A. Keesler, the Secretary of the company.

### "THE BEST WAGON POSSIBLE"

"It is our aim," he said, "to make the best and most desirable wagon that it is possible to construct from the best material. We employ only skilled workmen, and they are thoroughly imbued with our idea, which is expressed by the motto, 'Not how much but how good' work can be turned out in a day. For instance, the bodies of our wagons are made of the best birch, not seasoned in a dry kiln but in the open air. In the ironing of the body, No. 10 Band Steel is used around the top of both body and upper box to strengthen and protect it from shovels. The fact that the lightest grade of down draft malleable and wrought iron is also used in the ironing of the wagon where it is best adapted, is in its favor. The wheels are made of straight grained, tough, second growth, white ash, the best that money can buy. All the raw materials we contract for is guaranteed, and we have the privilege of returning any of it that is not up to the highest grade. We are so anxious to procure the best material and so desirous of interesting those who supply us in sorting it out, that we have offered them a higher price than they asked originally. We pay more than the market price to obtain the best, for we feel that the best is none too good. Our long experience has taught us that nothing is saved in purchasing any material because it is cheap.

"As might be expected, when we demand so high a guarantee on material supplied to us, we are willing to give the broadest guarantee to every purchaser of our wagons. If any part of our wagons should break on account of poor or defective material, or poor workmanship, within a period of one year from date of shipment, upon receipt of such part or parts, they will immediately be sent to the address of the owner at our expense. Very naturally we think our wagon has advantages over others, among which are included its easy draft, time and distance saved in turning, greater convenience for shovellers, as it is no higher than an ordinary wagon, automatic in dumping so that it will dump a load of any kind of material at any point, as the whole bottom opens at once, and time saved in dumping and closing the box."

### PHENOMENAL INCREASE IN BUSINESS

"The fact that our company has had a phenomenally large increase in its business during the past year, would seem to indicate that the people who use wagons for these various purposes are catching on

to the fact of their superiority. The demand has been so great that we have had to build a large addition to the factory, which is being run at its fullest capacity. We are now turning out about thirty-seven wagons per week."

The accompanying illustration shows two types of the Watson wagon. The first is catalogued as the grading wagon. This has a capacity of one and one-half cubic yards. It is intended for grading and general contract work, and will carry a load of 5,000 pounds. It has a  $2\frac{1}{2} \times 10$  steel axle in rear and a white hard maple axle in front with skeins  $3\frac{1}{2} \times 11$ . The height of wheels is 3 ft. 1 in. and 4 ft. 1 in., and its height from the ground to the top of the upper box is 4 ft. 8 in. The tread is 4 ft. 6 in. center to center of tire, unless otherwise ordered. Three or four inch tires are used as desired. The upper box is detachable. The weight of the whole is about 1,300 pounds.

The other wagon shown is known as the ash or garbage wagon. This has a capacity of three, four or five cubic yards. It is mounted on coil springs, with steel axles front and rear and is provided with drop wings on each side, which may be let down for convenience in loading. When the wagon is loaded to that point they can be put in position and the loading completed. The height of the wagon, when it is arranged for the three cubic yards capacity, to the fall of the wing is 5 ft. 2 in. and the height with the wing up is 6 ft. The wagon weighs from 2,200 to 2,600 pounds.

### IN USE IN MANY CITIES

The wagons have been used for many years in various cities and by many contractors for all purposes to which they are adapted. Just to show the satisfaction with which they have been employed we note a few letters of commendation. Mr. J. N. Alltop, Superintendent of Street Cleaning Department of Columbus, Ohio, is a recent letter to this company, said: "It is with pleasure we testify to the good qualities of your 'Dump Wagons.' We have seven of them in constant use (5 3-yard and 2 5-yard) some of which have been in use for a year and a half, and they are seemingly as good as when purchased. Never required any repairs. Other wagons purchased at same time are almost worn out. Since purchasing your wagons we have saved many dollars to the taxpayers of Columbus, as we can remove almost as much dirt with half the number of teams as formerly used, when we used wagons with large coal beds. We can heartily recommend the 'Watson Wagon' and claim its superiority to any we have yet seen."

Under date of July 25th, 1900, the General Construction Company of Cleveland, Ohio, had this to say about the use of one wagon



ASH OR GARBAGE WAGON

about your wagon and we have not spent one cent in repair work which had been purchased from the Watson Wagon Company: "Your wagon has been in constant use, now working alongside of dump wagons of other makes, and not a screw or bolt has been loose

upon it. Our other wagons have cost on an average of a little over \$5.00 a month to keep in repair, and your wagon has shown that it can handle five loads while any of the other wagons are handling three. Our foreman says that he would rather handle two Watson's than five of any other make, and that the service rendered will bear him out in that statement. We have twelve Springfield wagons of our own and have been renting ten others from W. H. Ford & Co. of this city. Mr. Ford needs his wagons on the 1st of the month and we have decided to purchase nine Watson wagons immediately. Mr. Ford has been watching the work of your wagon and tells me to-day that he is going to order six at once."

Silliman & Godfrey of Bridgeport, Conn., have a pleasant word to say also: "We received your two yard dumping wagon all right and have had it in constant use ever since. We cannot say too much in favor of it. We have used four wheel dump carts for years and thought we had the best in the world. But now they are all for sale cheap, and just as fast as they are sold or worn out we shall replace them with your wagons. You may expect orders from us next spring. We find that our horses can draw one-third more material with less work than in our old carts."

Descriptive circular and price lists will be mailed to any address upon application.

### EXPANDED METAL IN CUBA

THE general conditions as they existed in Havana, Cuba, at the beginning of the American occupation on January 1st, 1899, were such that in order to accomplish results in the way of re-modeling old public buildings that were found in an exceedingly dilapidated and filthy condition and to erect new buildings necessary to carry on public business, it was necessary for the military authorities to organize forces among civilian employees who would proceed with an actual work of improvement.



SPANISH HOSPITAL MILITAR AS REMODELED TO MODERN SCHOOL BY THE AMERICANS

These organizations gradually developed to such an extent that it was deemed advisable to continue on these lines and to execute nearly all of the improvements in the city with hired forces directly in charge of government officers. Much thought was given to methods of construction that it would be advisable to adopt in Cuba, and among other methods that have been tried, expanded metal and cement plaster for the construction of buildings has been the most extensively used.

The use of expanded metal by the Engineer Department, city of Havana, dates from January, 1900, when it was adopted in the construction of the Vaccination Station, erected on the corner of Zuleta and Genio streets, at a cost of \$12,000. This building was a success.

The claims which determined the use of expanded metal on the building, mainly rapidity of construction, minimum cost and pleasing appearance obtained at a small cost, were fully borne out by results obtained. The building has stood a test of two years in this climate, the results being entirely satisfactory. The use of expanded metal



SPANISH HOSPITAL MILITAR AS FOUND ON AMERICAN OCCUPATION IN 1899

in construction was from this time on adopted wherever practical in the work in charge of the Engineer Department. Roofs, floors and septic tanks were built of the heavy metal and lighter metal replaced the thin brick wall and the wooden lath in nearly every class of building constructed or repaired.

Expanded metal was used in the construction of the Administration building in connection with the city prison for the city of Havana, and large quantities of it were used in the remodeling of the old Hospital Militar into a modern school building; here the heavy metal was used in the construction of floors and staircases, and the light metal was used in panel walls, the plaster surface of which was easily made to conform in appearance with the surrounding masonry walls.

Expanded metal was also used in the construction of the new court room at the Municipal Vivac, the structure being fireproof throughout. Heavy expanded metal was used in forming the floors and roof of the building and light expanded metal was used in the construction of the walls. The heavy metal was also used in replacing the old wooden floors around the gallery with floors of concrete, spans between the iron beams supporting the new floor being 7' 6". The most important result obtained in the use of expanded metal in this building was the successful manner in which the plaster placed over the metal was matched with the surrounding masonry, a very important point which must be taken into consideration in the construction of additions to masonry buildings in Havana.

In nearly all of the above mentioned places where expanded metal was used, the principal reason for its adoption was economy, and in many cases much saving to the government was made, especially in the use of the heavy expanded metal in floor construction.

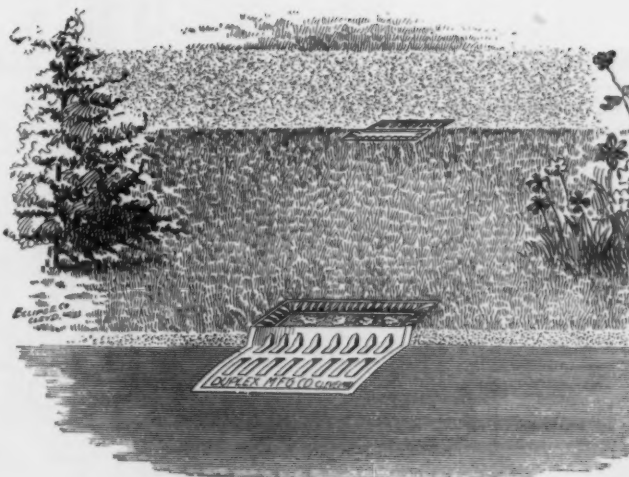
—The American Road Machine Company, of Kennett Square, Pa., has recently issued an attractive 48-page illustrated catalogue which will be of interest to all persons interested in road making.

—The Pittsburg Filter Manufacturing Company, of Pittsburg, Pa., recently sold to the Tennessee Coal, Iron and Railway Company a central gravity water softening plant of 25,000 horse-power capacity to purify the water used in the boilers of their industries in Ensley and Pratt City, Alabama. This will be, when completed, the largest water softening plant in the United States, if not in the world.



## A POPULAR BOULEVARD CATCH BASIN

THE time has come when every engineer realizes the importance of using the best possible device for receiving the flow of water from the street. A ride over the beautiful Boulevard of Cleveland, Ohio, from Gordon Park to Rockefeller Park, where the Duplex cover with round curb is used, will convince the most critical that it pays to buy the Duplex that has an adjustable curb to suit any depth of gutter. The makers of the Duplex have also a new park cover which is made to conform to grade of gutter and lawn, being the only one of the kind manufactured, and looks very artistic. The Duplex people manufacture a noiseless manhole cover, so constructed that it cannot be pushed out. It is much sought after and does not cost any more than the old style of cover. They also have a very desirable trap for catch basins; in fact, they have a design for every article needed in their line of business, and will be pleased to make any change to suit. They are up to date and any cover similar to the "Duplex" is an imitation and lacks the merits of the "Duplex."



## THE CHAMPION PORTABLE CRUSHING OUTFIT

THE constantly increasing sentiment for stone highways during the past decade, and the peculiar conditions surrounding the work of road building in many sections, has had the effect of stimulating the production of machinery for breaking and handling road metal. A few years ago it was the universal practice to install crushing plants in large quarries and to ship or haul the broken stone to distant points. The carriage, both by rail and by team, was expensive, and the excessive cost of material made it practically impossible to build any considerable mileage of stone roads in country districts. American inventive genius stepped into the breach at this point by pro-

had almost for the asking. This material is probably not all in one place. With a stationary plant it is necessary to haul the stone from one end of the township where it is found to the other end where the crusher is located. After the material is crushed it must be hauled back to build a road at the point where it was first found. With a portable crusher this expensive hauling is avoided. Instead of taking the stone to the crusher, the crusher is taken to the stone. The stone may be located in a dozen different parts of the town or township, but the machine can be easily and quickly transported to each point.

One of the best rock crushing plants of the portable type is shown in the illustration. This appliance, known as the Champion Portable Crushing Outfit, consists of a steel rock crusher, carrier and chute screen, all mounted on two "I" beam steel sills. These sills are carried on a four-wheeled truck. The whole outfit is moved on the road exactly as shown in the illustration. When it is desired to operate the crusher, two wood pieces are placed under the "I" beam sills at either end, and the rear end of the outfit is lowered by simply turning the screws as shown in cut, until the steel beams rest on the



ducing a machine that could be easily, quickly and conveniently transported from one point to another. The great value of this machine in solving the problem of improved highways can hardly be estimated. The older makes of rock crushers were crude, cumbersome and heavy; fitted only for permanent use in large quarries. The new machine could be hauled from point to point as easily as a heavy wagon. Let us consider what this improvement really means. Large number of the towns, townships and counties in the United States have an abundance of material for stone roads which can be

wood piece; the front end of the outfit is then lowered by removing the front part of the truck—the whole operation requiring about half an hour. When the crushing is finished and it is desired to move the plant the operation is reversed. A revolving screen is furnished instead of the flat screen when specially ordered.

This novel and practical crushing outfit, that is solving the problem of improved roadways in many sections, is sold by the Good Roads Machinery Company of Kennett Square, Penna. A catalogue giving full information will be furnished to anyone on application.

*Many Cities, Towns and Villages throughout the country are profiting by our extremely low CLUB RATE for supplying a copy of the .....*

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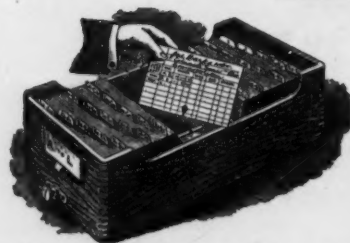
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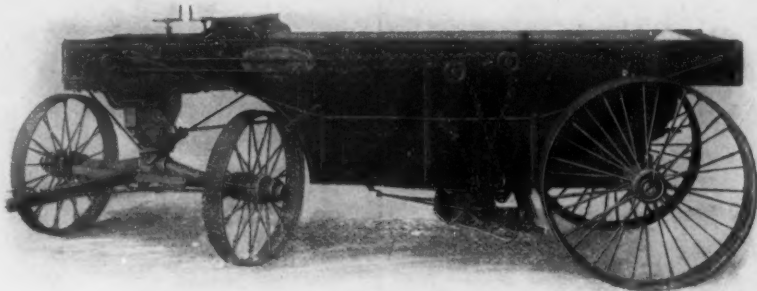
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# PATENTS

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